Rehabilitation Design And Systems Analysis Of The Cable Car Facilities

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Report on Sector II
(Trackway Systems Analysis)
to the San Francisco
Municipal Railway (MUNI)
Transit Improvement Program

Volume II:
Evaluation and Recommendations

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June 1979

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Part 2

Trackway Inspection and Evaluation

Section 2.1

CABLE

About 55,250 ft of cable are used for the three lines -- 18,000 for the combined Powell-Mason, 15,750 for the Hyde, and 21,500 for the California.

2.1.1 Description

The cable is specified (see Attachment 2.1.A) to be 1-1/4 in. in diameter (minimum, 1-9/32 in. [sic]; maximum 1-3/8 in.) and is composed of six 0.419 in. strands, each containing 19 mild plow steel wires, wrapped right lang lay around a sisal core. It weighs about 2.63 lb a ft. Diameters of the wires are: Center, 0.076 in.; center-covering, 0.074 in.; outer layer (as laid) -- three 0.122 in., six 0.098 in., two 0.098 in., one 0.112 in., two 0.098 in., and one 0.112 in.; intermediate layer filler three 0.036 in. adjacent to two 0.098 in. and two 0.074 in. (inside). Composition of center, filler, and intermediate wires ranges from AISI C-1034 to C-1054. Outer wires range from AISI C-1030 to C-1054; C-1030 is preferred to prevent excessive martensite transformation. Wire tensile strength, 130,000 to 210,000 psi, with maximum ± 15 percent variation in any one wire size. Maximum torsion, 32 revolutions per 100 wire diameters length. Minimum breaking strength, 82,000 lb; maximum, 100,000 lb. Rope lay, about 8.5 in. Strand lay, about 3-1/4 in. Helix height, about 1-5/32 in. Wire spacing, about 0.002 in.

Strand spacing, about 0.008 in. Core diameter, about 5/8 in., composed of three strands right lay.

Strands thoroughly impregnated with heavy pine tar during fabrication of rope. (Heavy pine tar is also applied by drip feeding for external lubrication.)

A new cable is installed by:

(1) Cutting the old cable in the machinery room at the car barn;

(2) Attaching the incoming end of the old cable to the rewinding machinery (take-up reel) by means of a short splice;

(3) Splicing the outgoing end of the old cable to the new cable on its shipping reel;

(4) Removing slack from the system;

(5) Pulling the new cable into the system by running the winding machinery at half speed;

(6) Winding the old cable, as it comes off the winding machinery, onto the take-up reel of the rewinder;

(7) Stopping the winding machinery when the end of the new cable enters the cable machinery room, letting slack into the system, and making an 80 ft (California type) splice; and

(8) Removing slack as the new cable is placed in service.

Although splicing follows a set procedure, skill and knowledge are required to make the splice uniform with the diameter and lay of the cable -- and to maintain it.

2.1.2 Inspection

Rope life varies by line. Maintenance records state that averages for the period 1975-1978 were: Powell-Mason line (including separate Powell and Mason ropes before April 1977), 48 days; Hyde line, 56 days; California line, 222 days. Chart 1, below, shows the life of each cable during the period, and Chart 2 shows the total ft used for each year.

Chart 1

CABLE LIFE
(1975-1978)

Powell Line

Installed Date	Cable No.	Days of Service
1/18/75	111	83
4/1/75	113	91
7/1/75	120	87
9/26/75	127	69
12/4/75	123	82
2/24/76	135	83
6/24/76	128	54*
8/17/76	137	77
11/2/76	143	79
1/20/77	146	78**

Mason Line

1/28/75	107	107
5/15/75	116	132
9/23/75	122	104
1/5/76	129	131
6/22/76	134	70*
8/31/76	139	128
1/6/77	144	92**

Powell-Mason Line

4/8/77	152	46
5/24/77	150	44
7/7/77	155	54
8/30/77	157	56
10/25/77	159	47
12/14/77	162	19
1/10/78	163	18
1/28/78	164	38
3/7/78	166	63
5/9/78	168	60
7/8/78	173	80
9/26/78	171	84
12/19/78	1	-

Hyde Line

Installed Date	Cable No.	Days of Service
1/6/75	115	65
3/12/75	117	62
5/13/75	119	63
7/15/75	121	41
8/28/75	124	13
9/23/75	125	43
11/4/75	126	35
12/19/75	131	42
1/20/76	133	59
3/20/76	136	49
6/15/76	138	47
8/6/76	140	47
9/22/76	142	50
11/10/76	145	38
12/18/76	147	59
2/15/77	149	63
4/19/77	151	63
6/21/77	154	41
8/1/77	153	46
9/16/77	158	67
11/22/77	160	43
1/12/78	161	68
3/21/78	165	75
6/3/78	169	91
9/2/78	172	87
11/24/78	174	-

California Line

7/8/75	118	290
6/2/76	130	189
12/7/76	132	235
10/4/77	156	220
5/20/78	167	-

* Stranded
** Combined April 1, 1977

Chart 2

CABLE USED

Line	Cable Length (ft)	1975		1976		1977		1978		TOTAL	
		No.	Ft	No.	Ft	No.	Ft	No.	Ft	No.	Ft
Powell	9,050	5	45,250	4	36,300	2	18,100	-	-	11	99,550
Mason	10,050	3	30,150	3	30,150	1	10,050	-	-	7	70,350
Powell-Mason	18,000	-	-	-	-	5	90,000	7	126,000	12	216,000*
Hyde	15,750	8	126,000	7	110,250	6	94,500	5	78,750	26	409,500
California	21,500	1	21,500	2	43,000	1	21,500	1	21,500	5	107,500
Total		17	222,900	16	219,600	15	234,150	13	226,500	61	902,900

* Total Powell and Mason, 385,900 ft

2.1.3 Evaluation

Evaluation of the cable is based on observation of the installation of new cable, splicing, and maintenance and inspection practices and on review of cable-life records, purchase specifications, and methods of fabrication. Useful cable-life is shortened by:

- Reduction in diameter due to wear;
- Fracturing of individual wires, which loosens wires and/or strands;
- Damage due to improper procedures by gripmen, such as failure to drop cable at let-go points; and
- Failure or separation of the splice.

Higher carbon-content wires are used in the cable to impart strength and resistance to wear. Lower carbon-content steel wires are used to impart flexibility and reduce the tendency to fracture. Carbon content of the steel is usually 0.35 to 0.50 percent for inside wires and 0.30 to 0.45 percent for outside wires.

Cable fabrication commences with 1/4 in. diameter steel rods containing specified amounts of carbon, manganese, phosphorous, and sulfur for both outside and inside wires. For outside wires, the rod is drawn five or six times to reduce the diameter to from 0.112 in. to 0.098 in. For inside wires, rods are drawn three to seven times to reduce the diameter, then are annealed (a lead-patenting process) and drawn thirteen times to

achieve the 0.036 in. diameter of filler wires and eight times to obtain the 0.076 and 0.074 in. diameters of the center wire and intermediate wires. The closing ("spinning") of the strands and then the cable requires art and experience to produce a cable of uniform diameter. The finished diameter is affected by the presence of kinked wires during the closings, the thickness and uniformity of the lubricant used during the closing, and the pressure applied to the squeeze rollers in closing the strands against the core.

The MUNI purchase specifications dated September 1971 are too broad and do not clearly identify for the suppliers the desired product or its intended use. For example, the specification for outer (crown) wires is:

> AISE C-1030 to C-1045; C-1030 range preferred so that outer (crown) wires shall have carbon content sufficiently low to avoid excessive martensite transformation upon friction gripping.

The statement is misleading in that C-1030 wires wear quickly and do not provide the strength required to prevent the splice from pulling apart. Martensite transformation takes place only if a temperature above 1300° F is maintained long enough for formation of austenite and if there is subsequent rapid cooling. The friction gripping of the cable is believed to generate temperatures above 1300° F, and cooling by air occurs rapidly. For steel with carbon content of 0.2 percent or more, this is sufficient to produce matensite transforma-

tion, but the martensiting effect on the cable of 0.30, 0.45, or 0.54 percent carbon content is not known. Recent use of lower carbon-content C-1030 crown wires resulted in cables of extremely short life due to rapid wear and the tendency of the splices to pull apart.

While internal lubrication of the cable with pine tar is satisfactory, external pine tar lubrication accumulates in the channel, blocking drainage and causing pulley malfunctions, and coagulation when the cable is not running at night causes an excessively high coefficient of friction with the pulleys at the morning startup and a consequent overload.

Attachment 2.1.A

CITY & COUNTY OF SAN FRANCISCO
PURCHASING DEPARTMENT

SPECIFICATIONS FOR CABLE CAR CABLE

September 1971

1. GENERAL (1.2; 2; 3.11.2)

Wire rope furnished under this specification shall be 1-1/4" diameter, in accordance with Federal Specification RR-410c for Type I, class 2 cable, except as hereinafter provided. Numbers in paranthesis following titles and subtitles refer to RR-W-410c.

The cable will be used for cable car propulsion using friction grips that are engaged and disengaged in service.

2. MATERIALS (3.1; 3.2; 3.3; 3.9; 3.11.2; Table XXXIX)

Core:

Fiber core shall be made of sisal (African, Java, Mauritius, Mexican and Yucatan); fiber shall be best quality used commercially for the manufacture of fiber cores, and shall be thoroughly cleaned and free from waste. Core shall be the firmer type of sisal, pine tar coated and wiped.

Polypropylene fiber core shall be pine tar coated and wiped polypropylene of best wire rope quality. It shall be assumed that natural fibers are being specified unless polypropylene is specifically mentioned on purchase order.

Wires: Composition of wires shall be within following limits. Exact composition depends upon chemistry, heat treating or patenting practice and wire drawing practice.

Center, Filler & intermediate wires -

AISI C-1034 to C-1054

Outer (crown) wires -

AISI C-1030 to C-1045; C-1030 range preferred so that outer (crown) wires shall have carbon content sufficiently low to avoid excessive martensite transformation upon friction gripping.

Minimum wire tensile strength	130,000 psi
Maximum wire tensile strength	210,000 psi
Maximum variation in strength in any one wire size	± 15%

Steel microstructure - euctoid ferrite, cold worked, preferred.

Minimum torsion for outer wires - 32 revolutions per 100 wire diameters length

All wires meet AISI wire rope steel specificaitons for mild plow steel, except as herein specifically modified.

3. CABLE MECHANICAL PROPERTIES

The finished cable shall have a minimum accepted breaking strength of 82,000 pounds. Design strength shall be approximately 90,000 pounds, and breaking strength shall not be more than 100,000 pounds.

4. FABRICATION (3.4; 3.6; 3.10; 3.11.2)

Wire Rope: Wire rope shall consist of six strands closed around a fiber core. Each strand shall be fabricated in one operation.

Preforming: Preforming shall be such as to hold the strands together, but shall be shallow enough to facilitate the making of an endless constant-diameter tuck-type splice.

Lays: Both the wire in the strands and the strands in the rope shall be laid to the right so as to make a right lang lay wire rope.

Lubrication: Wire rope strands shall be thoroughly impregnated with heavy pine tar during fabrication. No petroleum-base lubricant shall be used on strands during assembly. Pine tar shall be of naval stores origin.

5. CONSTRUCTION

Wire rope shall have six strands of sixteen main wires and three filler wires. Center wire shall be 0.076" diameter. The center wire shall be covered by six wires 0.074" diameter. The outer layer shall consist of three 0.112" dia. wires & six 0.098" dia. wires laid in a modified Warrington pattern, two 0.098," one 0.112," two 0.098" and one 0.112."

There shall also be three 0.036" diameter filler wires in the intermediate layer adjacent to two 0.098" diameter wires and two 0.074" diameter inside wires.

Tolerances: All wires in the rope shall conform to the diametral tolerances for uncoated rope wire in the current specifications of the American Iron and Steel Institute Wire Tolerances and Sizes.

Rope Lay: Approximately 8.5."

Rope Diameter: 1-1/4" diameter wire rope shall be 1-3/8" maximum diameter and 1-9/32" minimum diameter.

Strand Diameter: Approximately 0.419"

Strand Lay: Approximately 3-1/4"

Helix height: Approximately 1-5/32"

Wire spacing: Approximately 0.002"

Strand spacing: Approximately 0.008"

Core diameter: 5/8" nominal, composed of three strands right-lay.

6. CABLE LENGTHS

Cables must be furnished in the following continuous lengths (without splices):

Minimum Standard Cable Lengths	Cable Designation
9,150 Feet	Powell
10,150 Feet	Mason
15,700 Feet	Hyde
21,500 Feet	California

Lengths shown are at 70° F. Payment will be upon standard length only.

7. REELS (5)

Cables are to be furnished on stout reels, conforming to the following limiting dimensions, which are governed by existing equipment used to handle and control the reels of cables.

Diameter of barrel	47" minimum
Maximum flange diameter	108" (9' -0")
Maximum reel width	96" (8' -0")
Minimum reel width	87" (7' -3") California & Hyde Cables
	72" (6' -0") Powell & Mason Cables
Arbor hole size	16-1/4" x 16-1/4" square
Minimum rim width	3"
Size of dog pin holes adjacent to arbor hole	2-1/2" diameter
Distance from center of arbor hole to center of dog pins	21"

Empty reels shall be picked up at Contractor's expense, for reuse or disposal. Reel will be stopped braking against rim of head, as well as by square arbor and dog pins.

8. MARKING AND TESTING (4)

A metal tag shall be attached to the outer end of each reel of cable, stating cable length, size, grade, and rope serial number; there shall be another blank metal tag with space for date installed, line and rope serial number.

Certificates of manufacturing test results shall be made available to City upon request, including records of steel heat, billet, rod and wire history, physical properties, and chemistry.

The test methods shall be to ANSI, ASTM, AISI, or other United States, measuring techniques, insofar as possible.

Section 2.2

CONDUIT

2.2.1 Description

There are four types of conduit (For locations see Figure 2.2.a).

California Line 1877 (see Figure 2.2.b)

Installed about 1877 on California St west of Kearny St; slot rail supports modified in 1957 to permit use of bottom grip. Walls concrete throughout. Yoke formed of 40- or 50-lb Tee rail bent into shape of horseshoe, with two 1/2 x 3-1/2 in. flat bar braces supporting 3-1/2 x 3-1/2 x 3/8 in. horizontal Tee, to which 3-1/2 x 3-1/2 x 1/2 in. angle chairs are bolted; yoke imbedded in walls, but base of Tee rail and one face of braces exposed to channel (cavity). Conduit width, about 53 in. Conduit depth, about 36 in. Channel (cavity) maximum width, about 16.5 in. Channel depth, about 22 in.

California Line 1890 (see Figure 2.2.c)

Installed about 1890 east of Kearny St and on Hyde St. Walls concrete throughout. Yoke consists of rivet connected sections, including a 3 x 3-1/2 in. angle as base, two vertical 2-1/2 x 2-1/2 x 3/8 in. angles, and two 1/2 x 3 in. diagonal flat bars and two 1/2 x 3-1/2 in. horizontal flat bars at top supporting 4 x 6 x 1/2 in.-angle chairs; yoke imbedded in concrete, but face of vertical angles exposed to channel and portion of

diagonal flat bar exposed to earth. Conduit width, about 53 in. Conduit depth, about 36 in. Channel width, about 10 in. Channel depth, about 22 in.

Powell Line (see Figure 2.2.d)

Installed about 1887 on Powell, Mason, Washington, Jackson, and Taylor sts and Columbus Av. Walls brick about 14 in. thick, with concrete foundation. Yoke consists of bolt-connected sections, including a 3 x 3 x 1/2 in. angle as base, four vertical 2-1/2 x 2-1/2 x 3/8 in. angles forming channel, and two 2 x 2 x 1/4 in. diagonal braces and two 3-1/2 x 1/2 in. horizontal flat bars at top supporting 7 x 3 x 3/8 in. angle chairs; yoke embedded in brick concrete, and dirt. Conduit width, about 47 in. Conduit depth, about 36 in. Channel width, 10 in. (at pulley mounts). Channel depth, about 25 in.

Blind Conduit (See Figure 2.2.e)

Installed in 1957 without slot on Mason St from cable car barn to California St to permit operation of California line cable by winding machinery in barn. Consists of 15 in. diameter concrete pipe, with interspersed sheave and pulley pits.

The channels have 37 drains, which are located at the intersections of California and Front (2), California and

Grant (2), California and Stockton (2), California and Mason (1), California and Hyde (2), California and Polk (2), California and Van Ness (1), Hyde and Jackson (1), Hyde and Washington (4), Hyde and Broadway (1), Hyde and Beach (2), Powell and Sutter (2), Powell and California (1), Powell and Washington (2), Powell and Jackson (3), Jackson and Mason (1), Mason and Broadway (2), Columbus and Lombard (2), and Taylor and Francisco (1) -- see Figure 2.2.f .

2.2.2 Inspection

Visual inspection of the channel was made through pulley and other hatches. Of the 1695 locations inspected, 891 were in good condition -- free of debris, no pine tar buildup; 413 were in fair condition -- some debris, with sufficient accumulation to be touching pulley, but little tar buildup; 391 were in poor condition -- impaction of pulley by debris and tar, causing pulley to slow down or stop.

Twelve yokes were excavated between December 11, 1978, and January 4, 1979 to ascertain their condition (see Figure 2.2.g for location map). Results of visual examination include:

California Line 1877

California at Leavenworth, third yoke west of hatch CA-1327. Tee rail base corroded or otherwise worn away to 5/16 in. at one edge and knife thickness at other.

Diagonal braces corroded to about 5/16 in. at thickest point and knife edge at thinnest; width corroded to about 3-3/8 in. Chairs corroded away about 1/16 in.

Excavation of other yokes was deemed unnecessary, because examination through hatches of exposed portions indicated similar conditions throughout line.

California Line 1890

- California near Battery, fourth yoke east of hatch CA-300. Top flat bars heavily coated with rust and thickness and width corroded away by about 1/8 in; bolts securing bars to vertical angles loose due to corrosion of angles. Chairs in good condition, probably changed about 1958.
- Hyde near Broadway, first yoke south and corroded HY-1700. Diagonal flat bars rusted and corroded to about 3/8 x 2-3/4 in. Top flat bar rusted and corroded to about 7/16 x 3 in. Chairs and rail base badly corroded.
- Hyde near Greenwich, first yoke south of hatch HY-2179. Diagonal flat bars rusted and corroded to about 3/8 in. x 2-3/4 in. Top flat bar rusted and corroded to about 3/8 x 3-1/4 in. Chairs and rail base badly corroded.
- Hyde near North Point, second yoke south of hatch HY-2674. Diagonal braces rusted and corroded to

about 3/8 x 2-7/8 in. Top flat bar corroded to about 3/8 x 3-5/16 in. where in contact with soil. Chairs corroded to about 5/16 x 2-3/8 x 3-5/16 in.

Powell Line

- Jackson near Hyde, third yoke east of hatch JA-1389. Outside vertical angles heavily rusted, with 1/16 to 1/8 in. metal loss. Diagonal braces corroded to knife-edge thickness at some points. Top horizontal bars corroded away by about 1/8 in., and chairs corroded to less than 1/16 in. thickness.
- Washington near Leavenworth, first yoke east of hatch WA-1391. Outside vertical angles heavily rusted and corroded to about 1/8 x 2 x 2-1/8 in. Diagonal supports corroded to about 1/16 x 1-3/4 x 1-3/4 in., and edges corroded to knife-edge thickness. Top horizontal bars rusted and corroded to about 5/16 x 3-1/8 in. Chairs corroded to about 3/8 in. thickness, and chair supporting north rail broken at yoke, providing no support to rail.
- Mason near Filbert, second yoke north of hatch MA-1877. Outside vertical angles corroded to about 1/8 x 1-15/16 x 2-1/4 in. Diagonal supports almost corroded away. Top horizontal bars covered with rust and corroded away by 1/16 to 1/8 in. Chairs probably changed in 1950 and in good condition.

- Columbus near Lombard, second yoke north of hatch CO-886. Outside vertical angles completely corroded away at point about 1-1/2 in. below chairs. Diagonal braces corroded away at same point. Top horizontal bars corroded away by about 1/16 in. Chairs installed in 1950 and in good condition.
- Powell near Clay, seventh yoke south of hatch PO-981. Outside vertical angles rusted and corroded away by about 1/4 in. Diagonal supports corroded away by about 1/8 in. at best, tapering to knife-edge dimensions. Top horizontal bars, lightly rusted and corroded away by about 1/16 in. Chairs slightly corroded.
- Powell near Geary, second yoke south of hatch PO-260. Outside vertical angles rusted and corroded away by about 1/4 in. Diagonal braces completely corroded away where bolted to vertical angles. Top horizontal bars covered with rust and corroded away by 1/16 to 1/8 in. Chairs rusted.
- Powell near Ellis, third yoke south of hatch PO-133. Outside vertical angles rusted and corroded to about 5/16 x 2-3/8 x 2-3/8 in. Diagonal braces rusted and corroded to about 3/16 x 1-7/8 x 1-7/8 in. Top horizontal bars rusted and corroded away by 3/16 to 3/8 in.

Chairs rusted, and chair face adjacent to outside rail so corroded it had separated from yoke.

The blind conduit is in very good condition.

2.2.3 Evaluation

California Line 1877

Metallurgical evaluation was made of a yoke, with plate brackets and fasteners of rivets, bolts, and nuts, which had been removed from the street in 1973. Results indicated that corrosion has severely impaired the yoke's ability to bear the loads of cable car and vehicular traffic (see Attachment 2.2.A, below). Because the pattern and extent of corrosion were highly varied and similar conditions were observed in other yokes inspected, it is probable that encasement in concrete did not protect yokes from deterioration and that the inability to bear required loads is prevalent.

California Line 1890

Construction and age of the yokes and inspection results indicated that conditions similar to those in California 1877 conduits obtained. A metallurgical evaluation was unwarranted, because it would require removal of a yoke now in the system.

Powell Line

Two corings were made of the conduit on Mason St near Vallejo. In the first coring the brick and motor joints were found to be in good condition, with a compressive strength of 1840 psi; but the concrete foundation had a rock pocket and therefore could not be tested. The concrete was found in a second coring nearby to be in good condition, with a compressive strength of 3040 psi. (For both corings see Attachment 2.2.B.)

Metallurgical evaluation of components taken from five excavated yokes revealed extensive corrosion in all samples. It is doubtful that any of the components can be relied on to sustain cable car and vehicular loads. Because all tests yielded similar results, it must be assumed that yokes throughout the line are in similar condition. (See Attachment 2.2.C.)

Blind Conduits

Of recent construction, the conduits appear to be structurally sound.

Conclusions

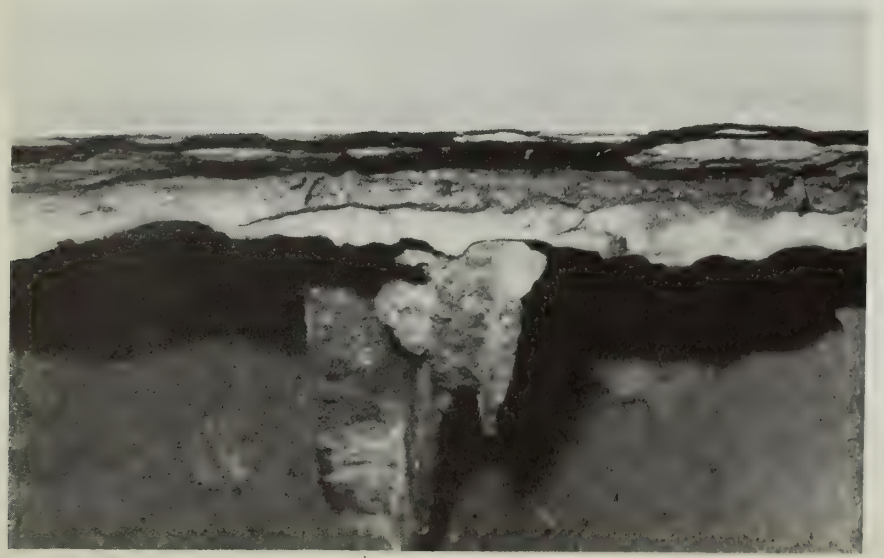
Structural deterioration of the California line 1877, California line 1890, and Powell line conduits has advanced to the point that rail cannot be safely fastened to the yokes (see Section 2.6) and failure under H20 highway loading is possible. Poor drainage

results in the accumulation of debris and pine tar, which interferes with the functioning of subsurface equipment (see Sections 2.4 and 2.5).

Illustrations

Corrosion at interface of angle and horizontal flat bar (California near Battery).

Disintegrated diagonal brace supporting chair (Powell near Geary).

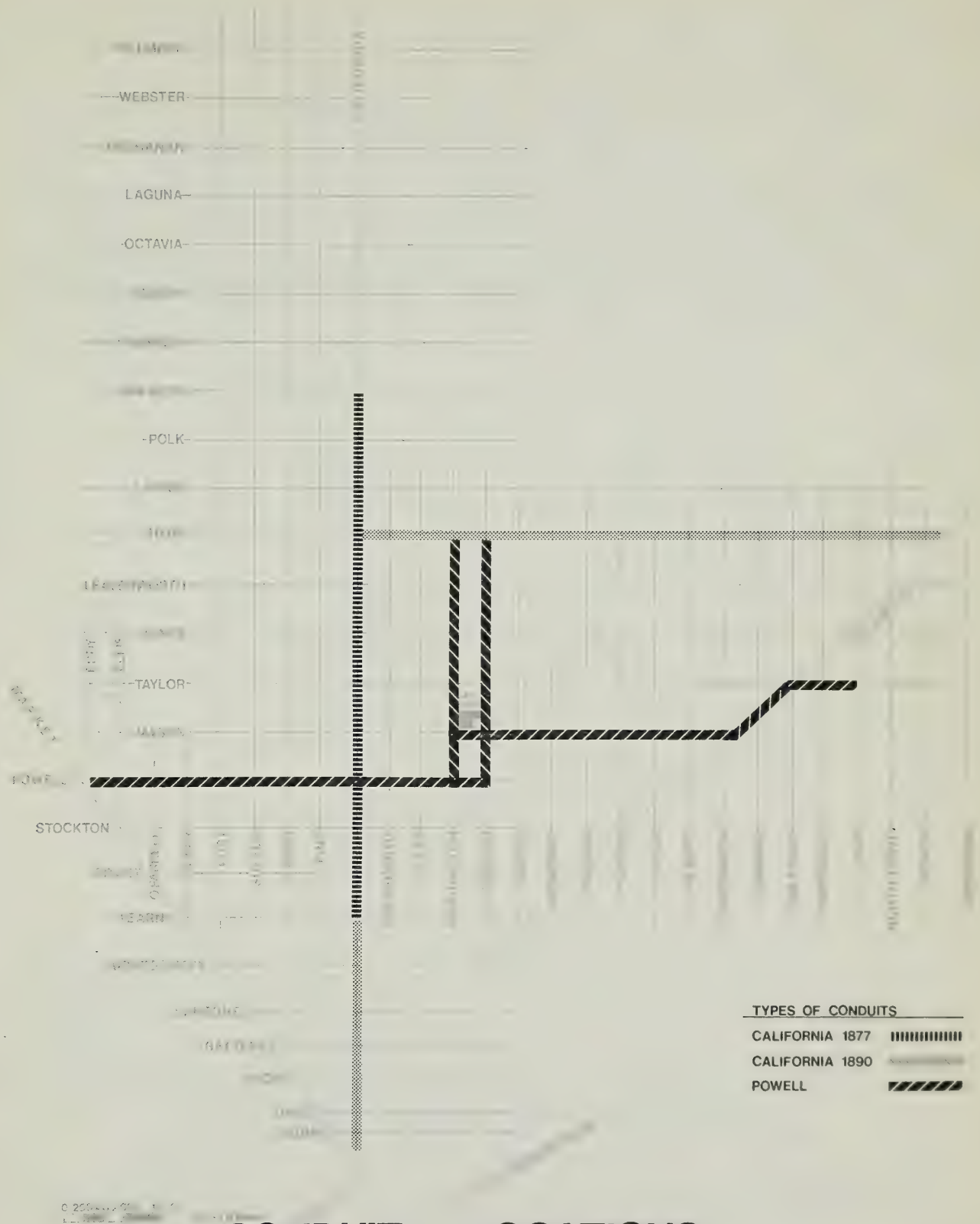


Deteriorated rail and chair, with rotted wood filler between rail and brick paving (Powell near Ellis).

Vertical chair support corroded through, and extensive corrosion of horizontal support (Columbus near Lombard).

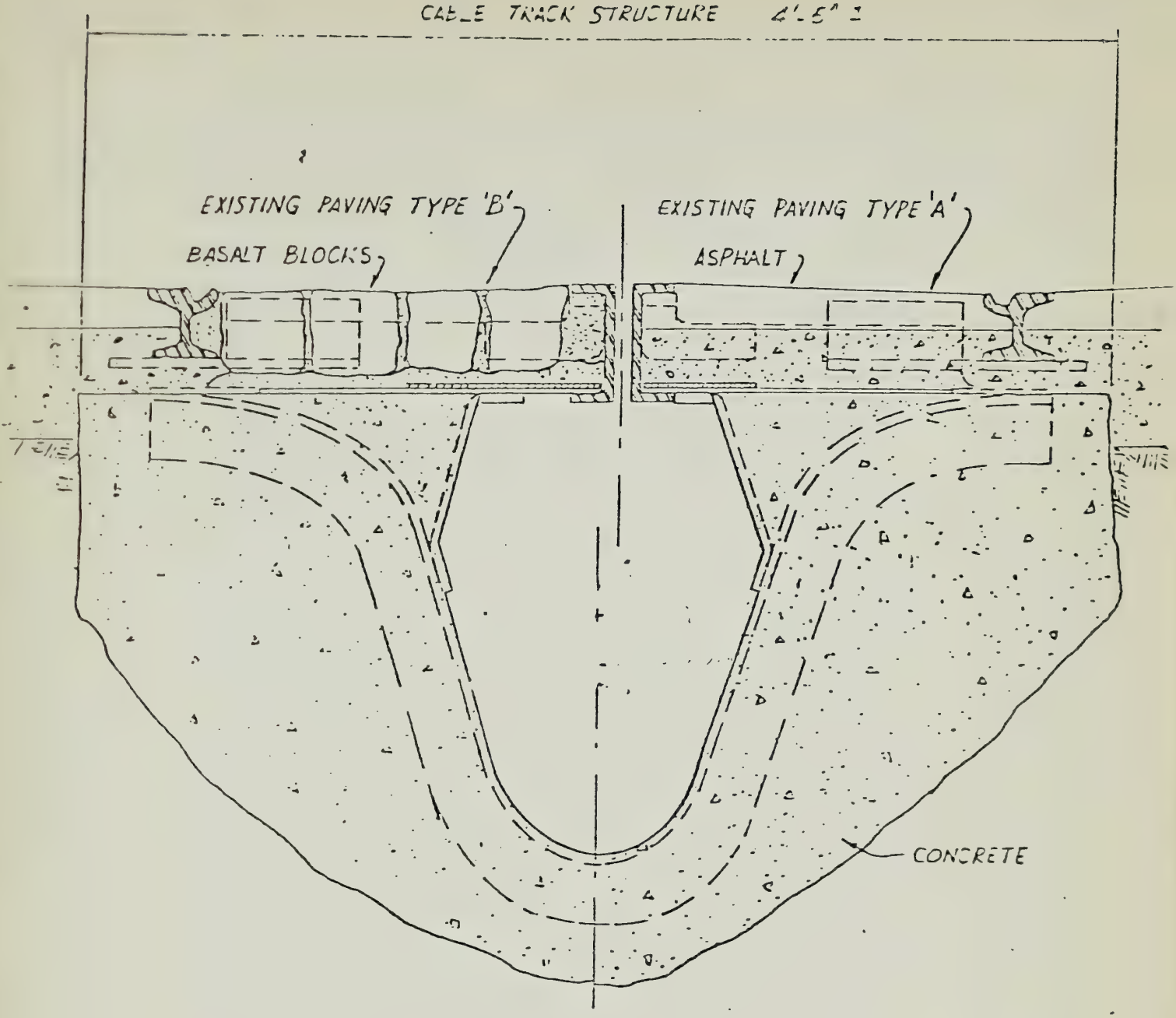
Chair corroded in half at yoke, providing no support for rail (Washington near Leavenworth).

Figures



CONDUIT LOCATIONS

FIGURE 2.2.a



SECTION SHOWS TWO EXISTING PAVING CONDITIONS 'A' AND 'B'. EITHER OR BOTH CONDITIONS MAY BE FOUND IN TRACK STRUCTURE. EXISTING PAVING BETWEEN TRACK STRUCTURES MAY ALSO BE EITHER 'A' OR 'B'.
FOR EXISTING YOKE DETAILS, SEE AL-2480.

CITY AND COUNTY OF SAN FRANCISCO — PUBLIC UTILITIES COMMISSION

UTILITIES ENGINEERING BUREAU

MUNICIPAL RAILWAY

CALIFORNIA ST. KEARNY ST. TO VAN NESS AVE.
TRACK PAVING · SECTION

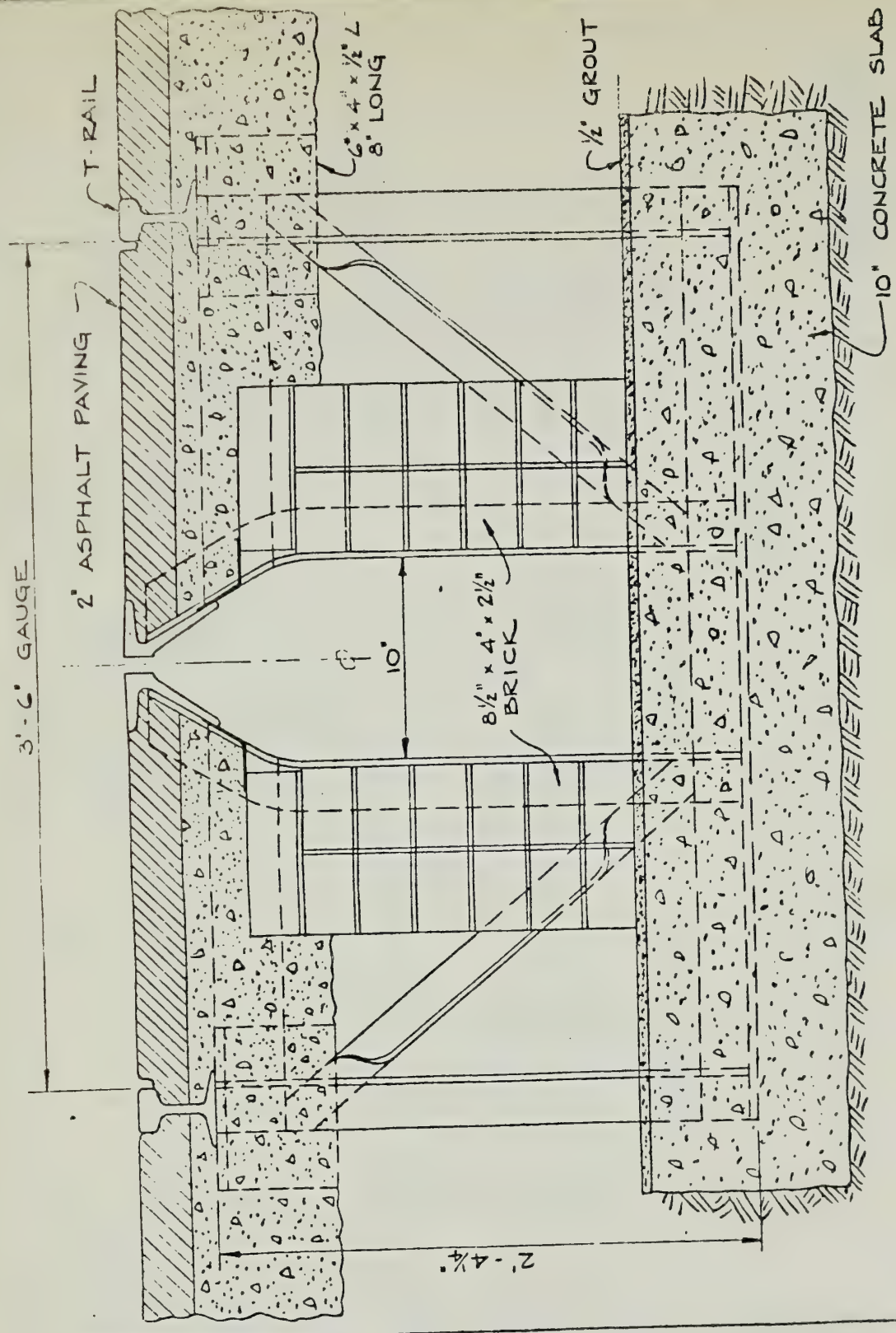
HPG	TR.	APPROVED	SCALE 1½" = 1-0	DATE APRIL 1955	LATEST REVISION
R. HPG	CH. E.V.H.	FIGURE 2.2.b	DRAWING NO AL-2481	REVISION NO. 0	
COMPARED					

YOKE USED ON ALL OF HYDE ST. AND CALIFORNIA ST. EAST OF KEARNY. INSTALLED IN 1890 WHEN C.S.C.R. EXPANDED

SAN FRANCISCO PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY

TYPICAL YOKE
CALIFORNIA ST. TYPE 1890
CABLE TRACK CONSTRUCTION

FIGURE 2.2.c



THE GENERAL DIMENSIONS OF THE CONDUIT ARE AS MEASURED AT CLAY & BATTERY STS. & PROBABLY APPLY TO THIS TYPE OF CONSTRUCTION ELSEWHERE, BUT SOME VARIATION CAN BE EXPECTED.

SAN FRANCISCO PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY

CABLE TRACK - TYPICAL SECTION
POWELL ST. TYPE
T-RAIL CONSTRUCTION

BY M.C. CH E.V.H.	SCALE 1½" = 1'-0"	DATE 11-24-50	DRAWING NO. AL-238
OK F.L. Ross	FIGURE 2.2.d	REVISED	
APPROVED O.K. Sigman			

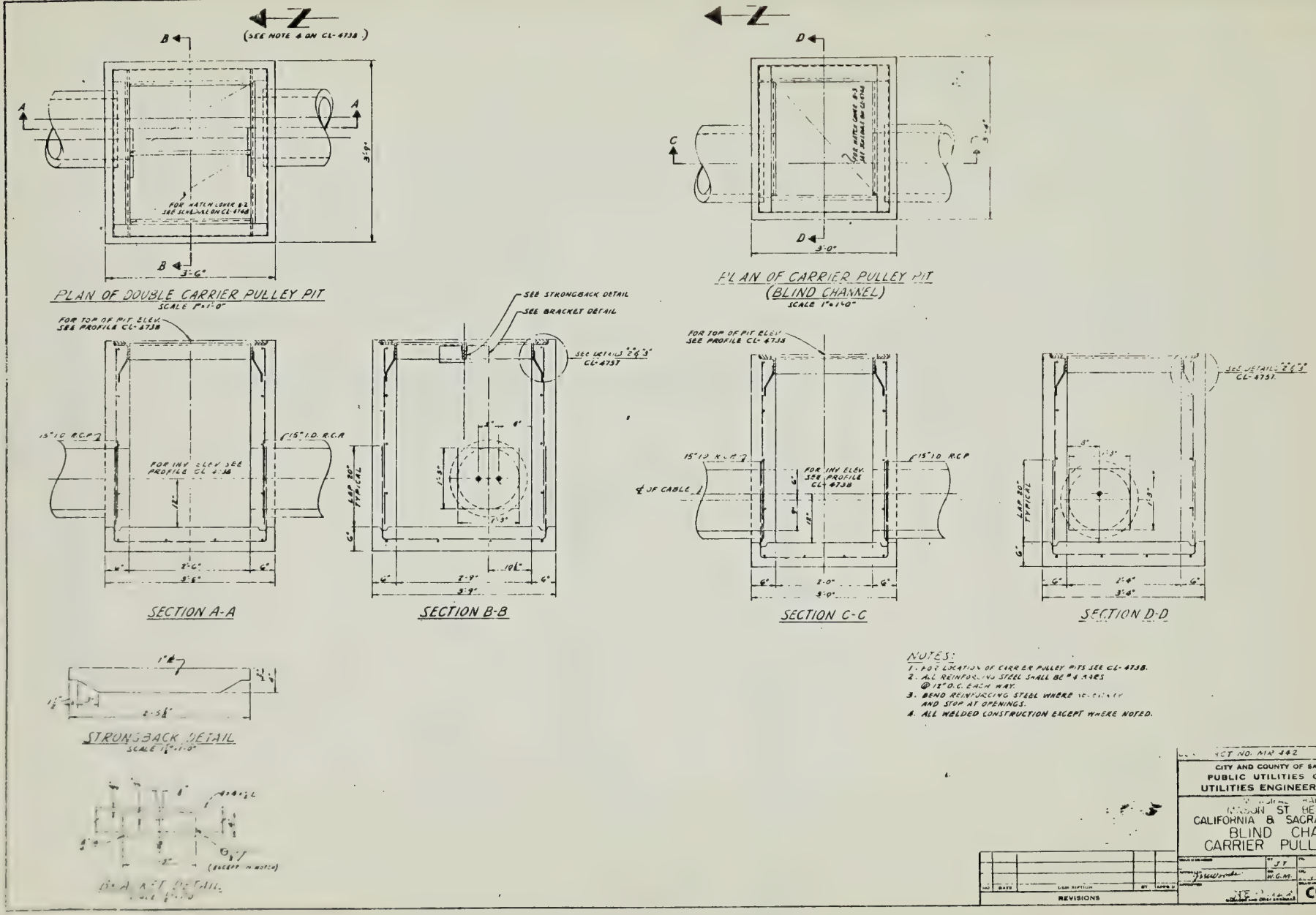
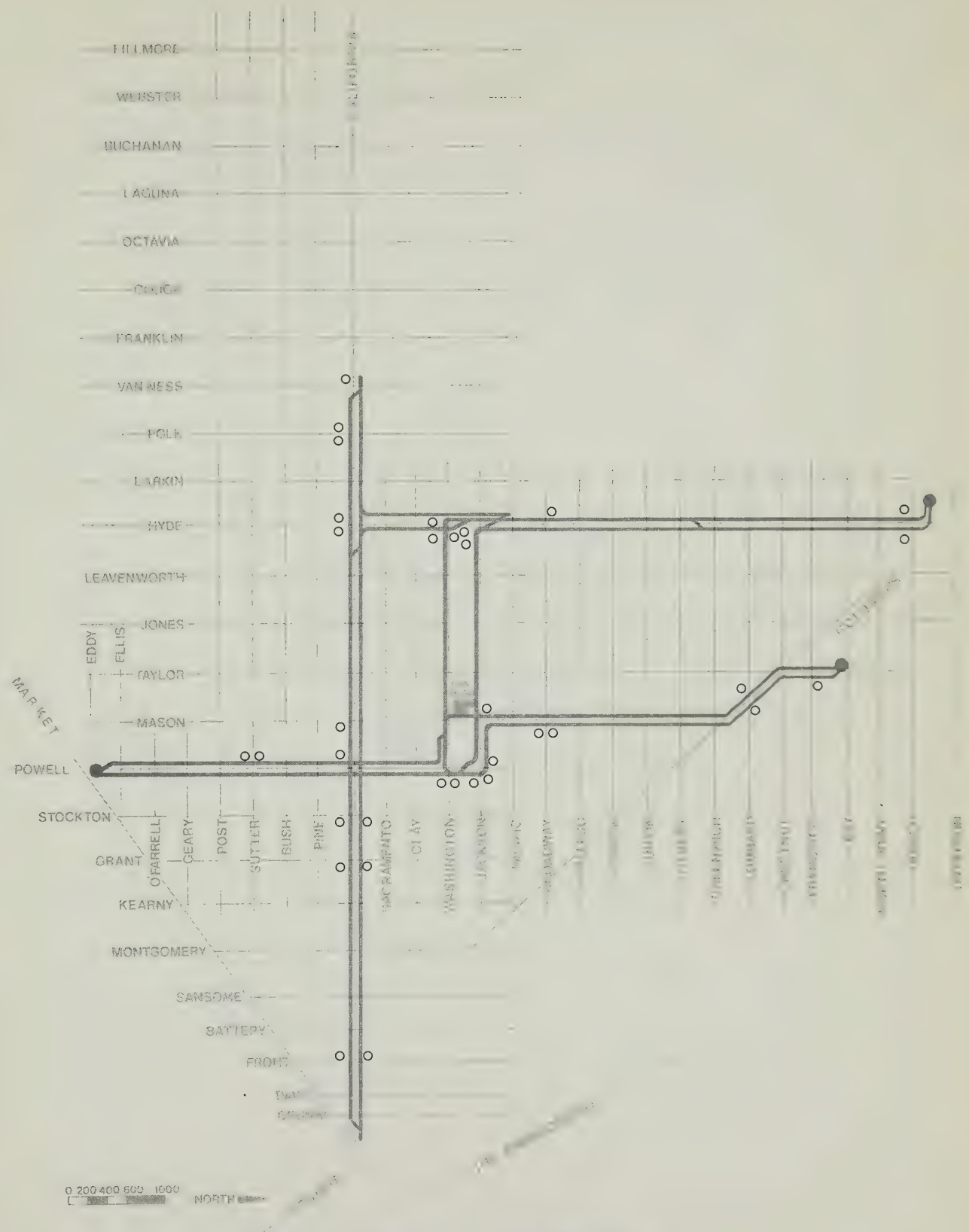
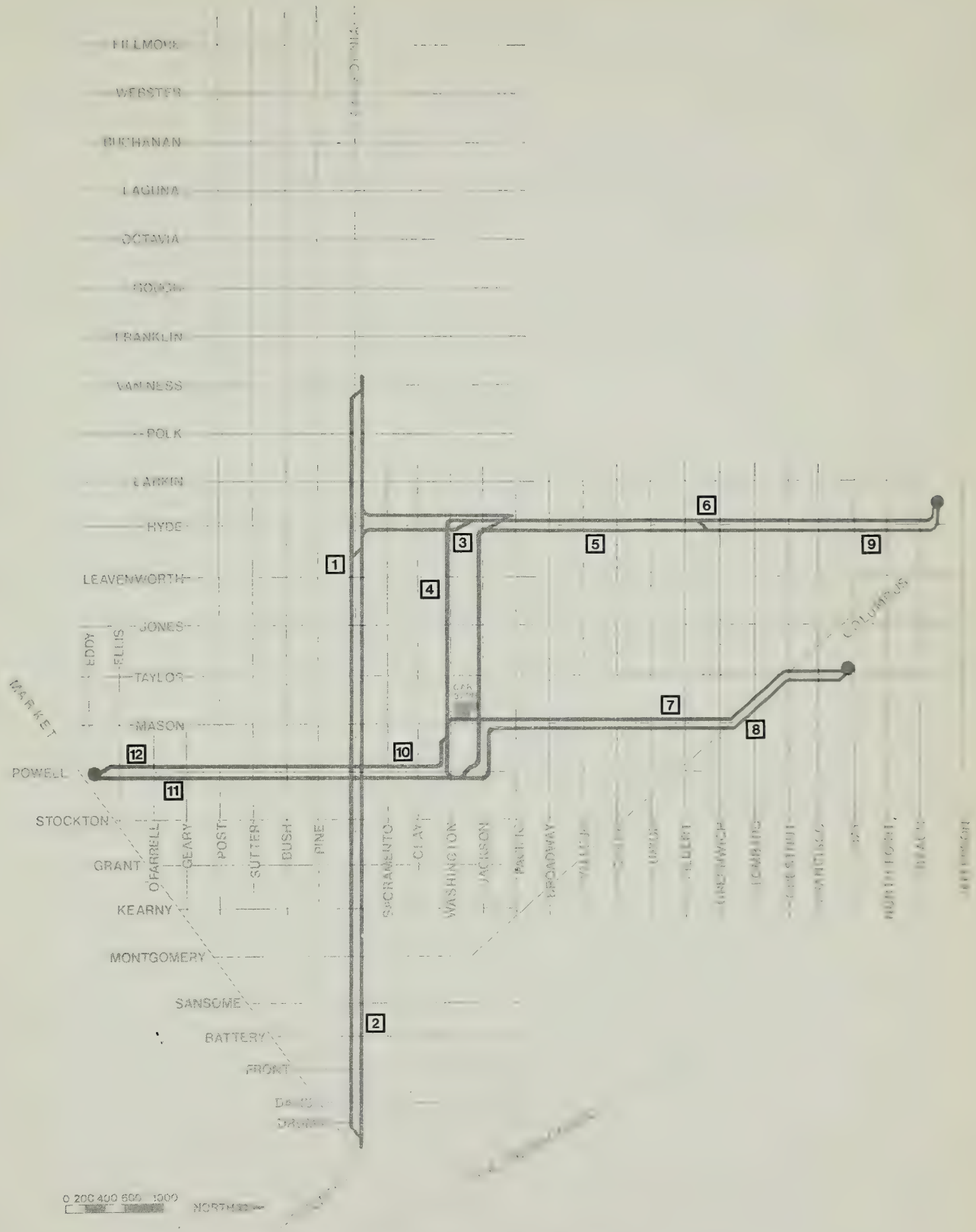

PLAN OF DOUBLE CARRIER PULLEY PIT
SCALE 1"=1'-0"
PLAN OF CARRIER PULLEY PIT
(BLIND CHANNEL)
SCALE 1"=1'-0"
SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D
STRONGBACK DETAIL
SCALE 1"=1'-0"
NOTES:
1. FOR LOCATION OF CARRIER PULLEY PITS SEE CL-4738.
2. ALL REINFORCING STEEL SHALL BE #4 BARS @ 12" O.C. EACH WAY.
3. BEND REINFORCING STEEL WHERE NECESSARY AND STOP AT OPENINGS.
4. ALL WELDED CONSTRUCTION EXCEPT WHERE NOTED.
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
CALIFORNIA & SACRAMENTO STS.
BLIND CHANNEL
CARRIER PULLEY PIT
REVISIONS
CL-4749
0

FIGURE 2.2.e



CHANNEL DRAINS

FIGURE 2.2.f



YOKE EXCAVATIONS

FIGURE 2.2.g

Attachment 2.2.A

PHONE (415) 939-1910

FORD ASSOCIATES
METALLURGICAL ENGINEERING CONSULTANT

3100 LA PLAYA COURT
LAFAYETTE, CALIFORNIA 94549

March 29, 1979

Mr. Dick Baker, Vice President
Chin & Hensolt, Consulting Engineers
182 Second Street
San Francisco, Ca. 94105

Dear Mr. Baker:

This report is to show the condition of a yoke originally installed at California St. near Kearny. The yoke assembly was installed as original equipment and records indicate the construction in that area began in 1877 as part of the "California Street Cable Railroad". The yoke assembly was removed in 1973 and that location is now designated as "California Line 61". The major formed section of the yoke is of the 1877 vintage with newer center brackets of a more recent date.

The construction of the U-shaped area of the yoke assembly was from railroad rail. The bracketry attached to this section showed various degrees of corrosive attack and the center brackets had been replaced at a recent date relative to the rest of the brackets.

Photos A and B show both sides of the yoke "as received" from Mr. Kevitt R. Day, Cable Car Machinery Supervisor, Municipal Railway, San Francisco.

Beginning from the left side of Photo A, smaller areas were photographed to show in greater detail the condition of the yoke. Note the yoke was originally made from a rail.
Photos C and D - left end of yoke - Photo A
Photo E - outside curvature of yoke (rail).
Photos F and G - top section of yoke - Photo A
Photos H and I - right end of yoke - Photo A

Note on Photos A and B the general corroded condition where

metal surfaces are exposed as compared to the "new" brackets located near the center along the bottom, Photo A. Some fasteners are not visible on the brackets because of the aggregate adhering to the steel surfaces.

Photos C and D show various degrees of corrosive attack depending on the length of time in service and whether or not they were exposed to other than aggregate.

Photo E shows the corrosion on the yoke as well as the location of some aggregate.

Photos F and G show the detailed surface of the top of yoke (Photo A). Note the heavy corrosion layer where the rail is exposed.

Photos H and I show the comparative corrosion between the "new" bracket and its fasteners and the remaining brackets in the same area.

In order to achieve a better definition as to the extent of the corrosion on the cross section in various areas of the yoke assembly the yoke had to be sectioned. If an attempt would have been made to remove the aggregate on the surface prior to sectioning, undoubtedly the corrosive layer would have been damaged or destroyed and thus not provide the needed information regarding the extent of corrosion. For this reason certain areas were chosen for sectioning by sawing and adjacent non-critical areas were torch cut into smaller sections to facilitate the sawing.

Photos 1 thru 10 are from sections of the yoke assembly. Photo 1 shows the parts of the yoke assembly after sectioning. Photo 2 shows the designation of each part by number. The locations of torch cutting are between sections designated 2 and 3, 3 and 4, 7 and 8, and 8 and 9. Note the torch cutting was done so the heat from the torch would not influence the cross sections to be examined.

Photo 3 shows the sawed and polished cross sectional area between sections 1 and 2 in Photo 2. The top is the rail which was used to form the yoke with the other sections being brackets and fasteners used to make up the yoke assembly.

Photo 4 shows the same section as Photo 3 but after etching to reveal more clearly the details of the yoke assembly as well as the degree of corrosion. Note on Photo 4 (1) the corrosive attack on the rail web (2) the surfaces between the rail web and the lower bracket member and (3) the ends of the fasteners. Also note the flow lines from the rivet fasteners and how the fasteners have been attacked at greatly different rates even though they are relatively close together.

Photos 5 and 6 were taken of a cross section practically adjacent to Photos 3 and 4. The width of the saw cut is the distance between these 2 sets of Photos. Photo 5 is saw cut and polished, and Photo 6 is etched. Note the lack of consistency in the corrosive attack areas designated "1A", "2A" and "3A" corresponding to areas 1, 2 and 3 in Photos 3 and 4.

Photos 7 and 8 are taken of the slice number 5 on Photo 2. Photo 7 is saw cut and polished and Photo 8 is etched. In Photo 7 note the corrosion layer on the bottom of the rail flange and the attack under the head of the rail and along the web on the right side. In Photo 8 note the corrosion products (rust) that appears rust-orange in color and are located along the web and under the head of the rail on both sides.

Photos 9 and 10 are located by number 7 on Photo 2. While approximately 10" away from slice 5 shown in Photos 7 and 8, the degree and pattern of corrosive attack is greatly different. Photo 9 is saw cut and polished and Photo 10 is etched. Note the differences of metal thickness in this location compared to Photos 7 and 8. The corrosion layer in Photo 10 appears primarily along the left side of the web and head of rail with metal thickness being appreciably greater (and therefore, affording more strength to the yoke assembly) than in Photos 7 and 8.

Conclusions:

(1) The yoke assembly was made from rail, the brackets from plate and the fasteners from rivets, bolts and nuts.

(2) Presence of aggregate on the metal surfaces could not be correlated to the degree of corrosive attack found in the cross sectioned areas examined.

(3) Because of the high degree of variation of corrosion found in the examined cross sections and the fact that further corrosion has taken place in street locations where similar yokes are still in service, it is evident the load carrying capability of the yoke assembly is severely impaired when compared to the original design criteria on which the fabrication and installation of these original yokes was based.

If we can be of any further assistance in this study, please let me know.

Sincerely yours,

ROBERT G. FORD
Professional Engineer
State of California
Cert. #MT863

RGF/ekf

PHOTO "A" YOKE ASSEMBLY-FRONT VIEW

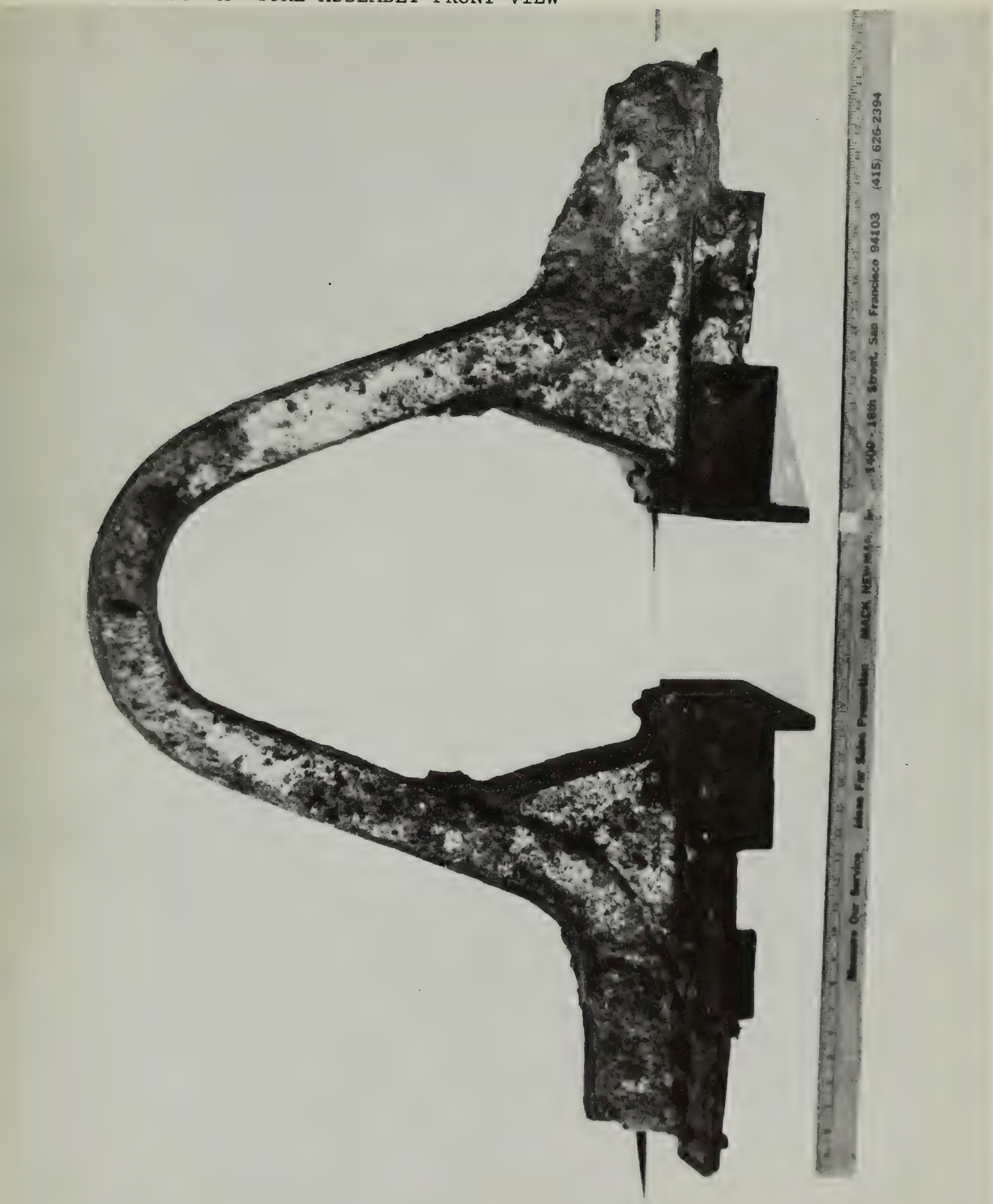


PHOTO "B" YOKE ASSEMBLY- REAR VIEW

PHOTO "C" YOKE ASSEMBLY- FRONT VIEW -LEFT END

PHOTO "D" YOKE ASSEMBLY- REAR VIEW- LEFT END

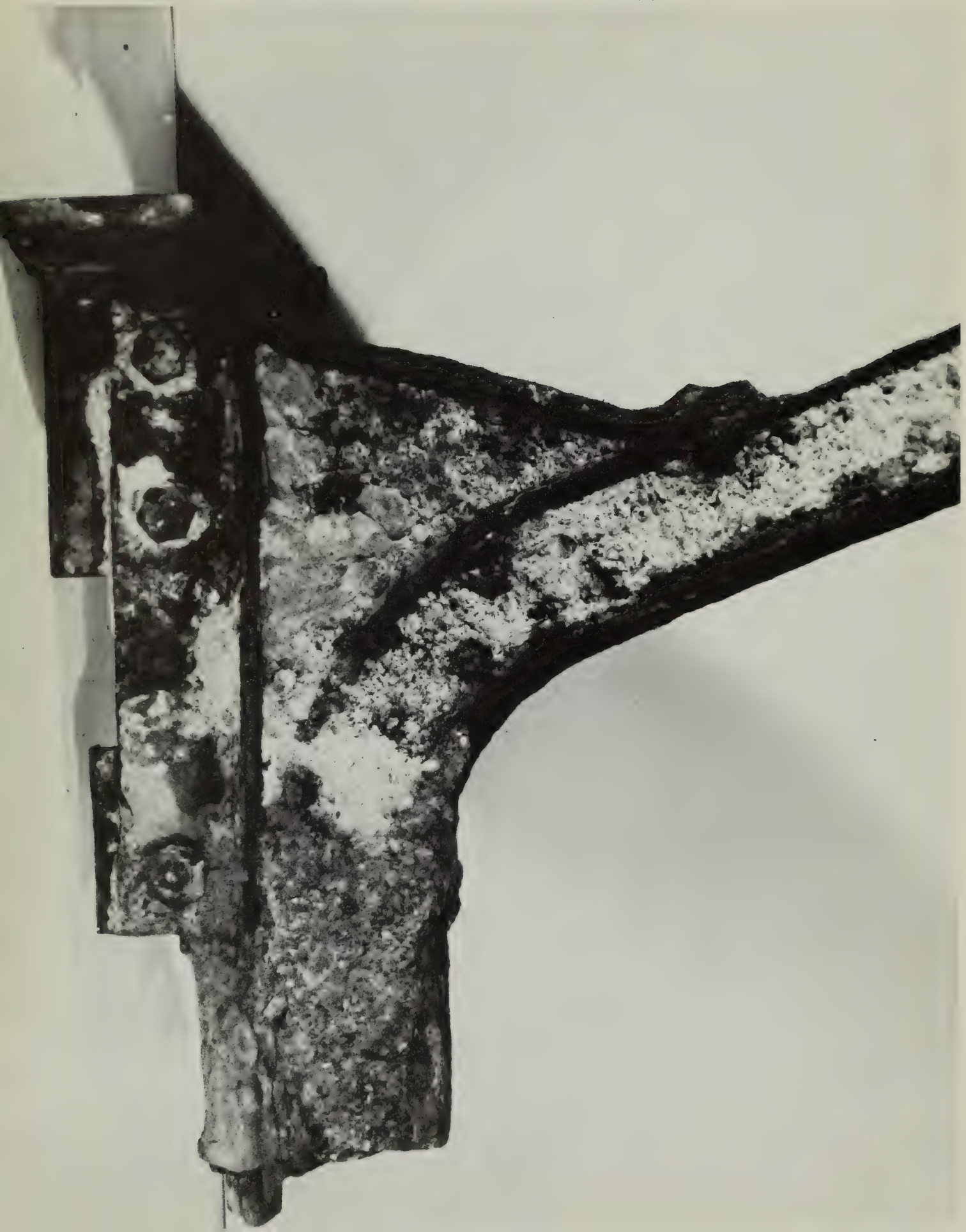


PHOTO "E" YOKE ASSEMBLY- OUTSIDE CURVATURE

PHOTO "F" YOKE ASSEMBLY-FRONT VIEW- CURVED SECTION

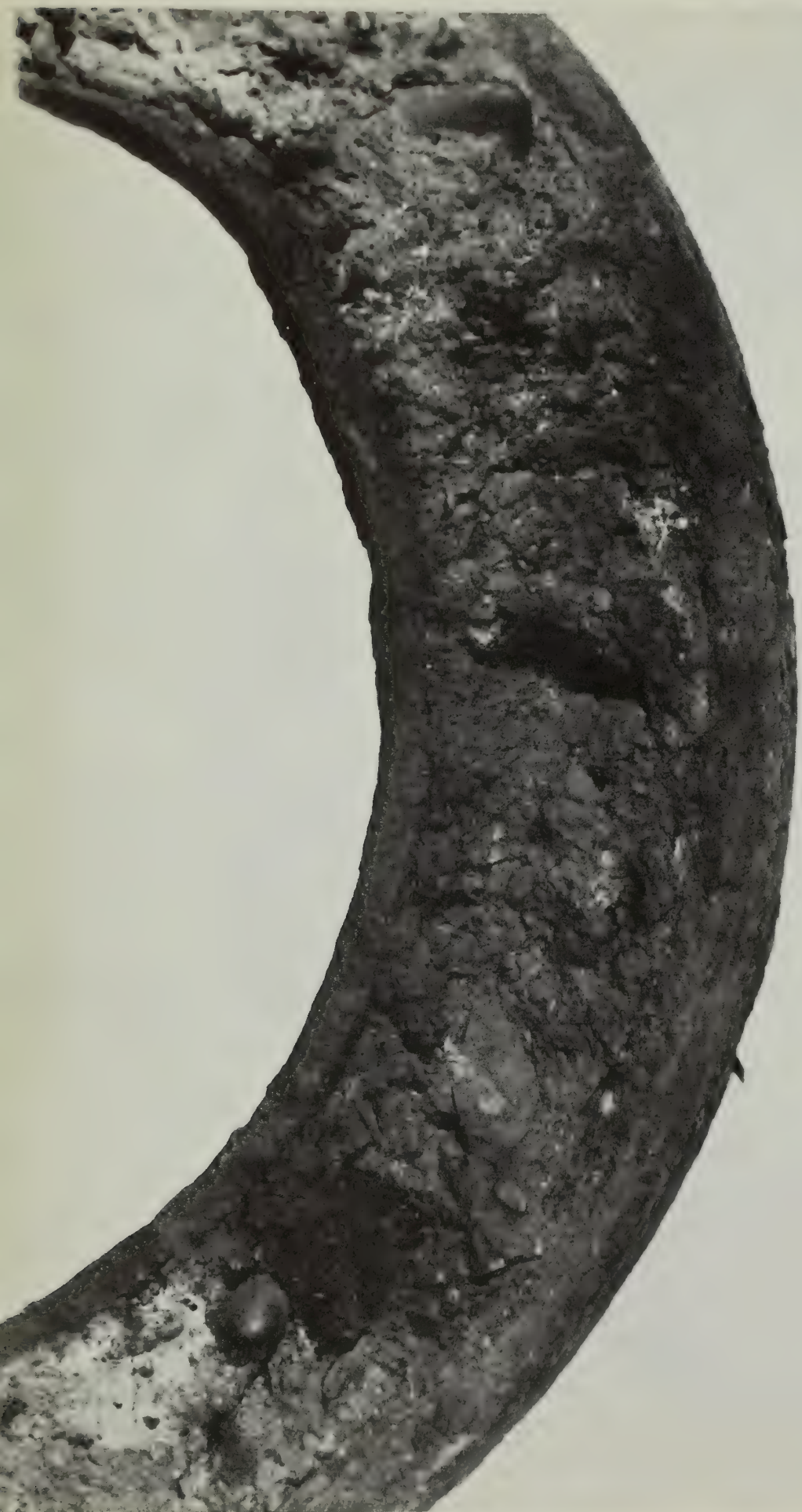


PHOTO "G" YOKE ASSEMBLY-REAR VIEW- CURVED SECTION

PHOTO "H" YOKE ASSEMBLY-FRONT VIEW- RIGHT END

PHOTO "I" YOKE ASSEMBLY- REAR VIEW- RIGHT END

PHOTO 1-YOKE ASSEMBLY AFTER SECTIONING

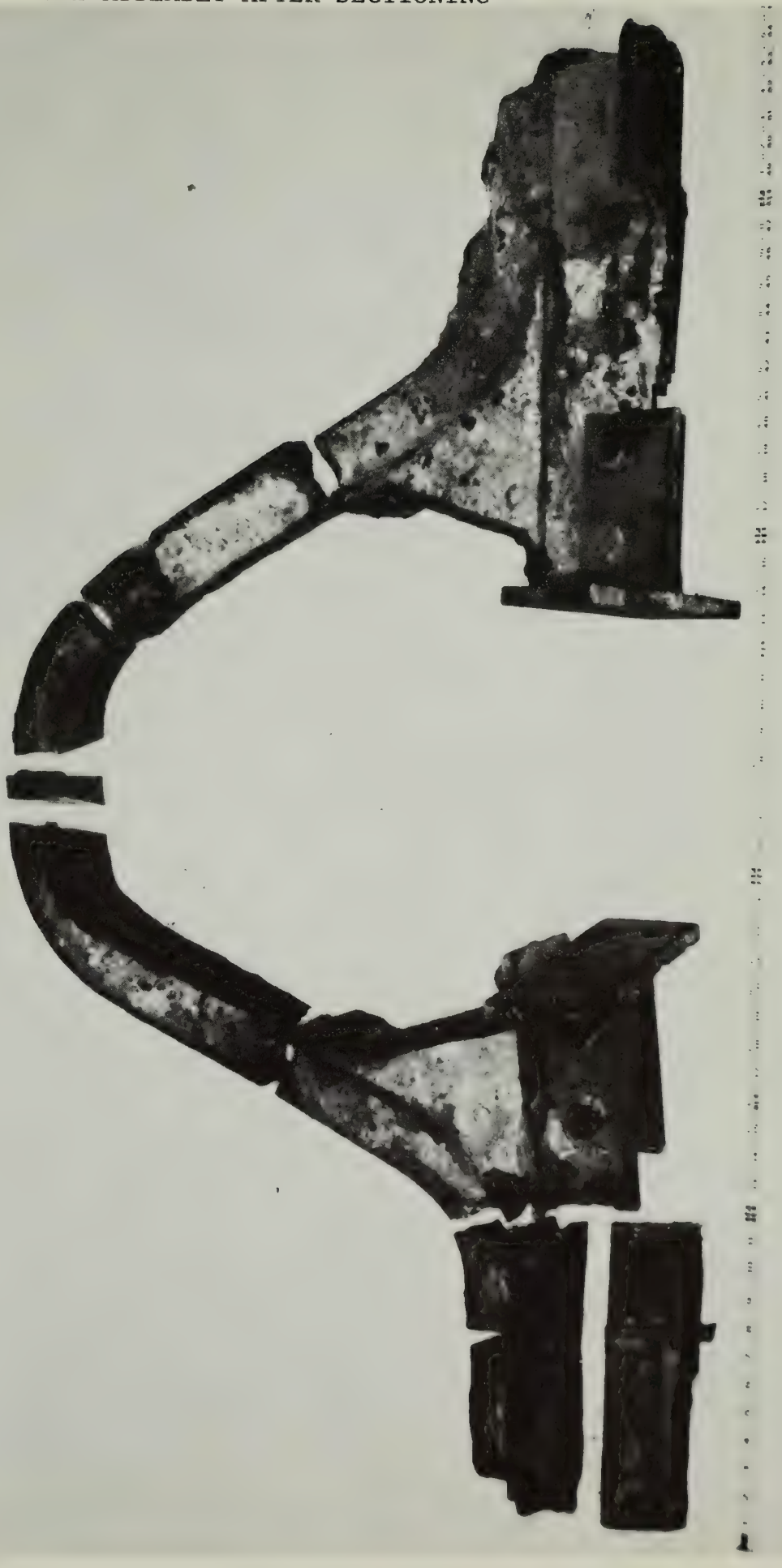


PHOTO 2-SECTIONED YOKE -NUMBERED SECTIONS- REFER TO TEXT

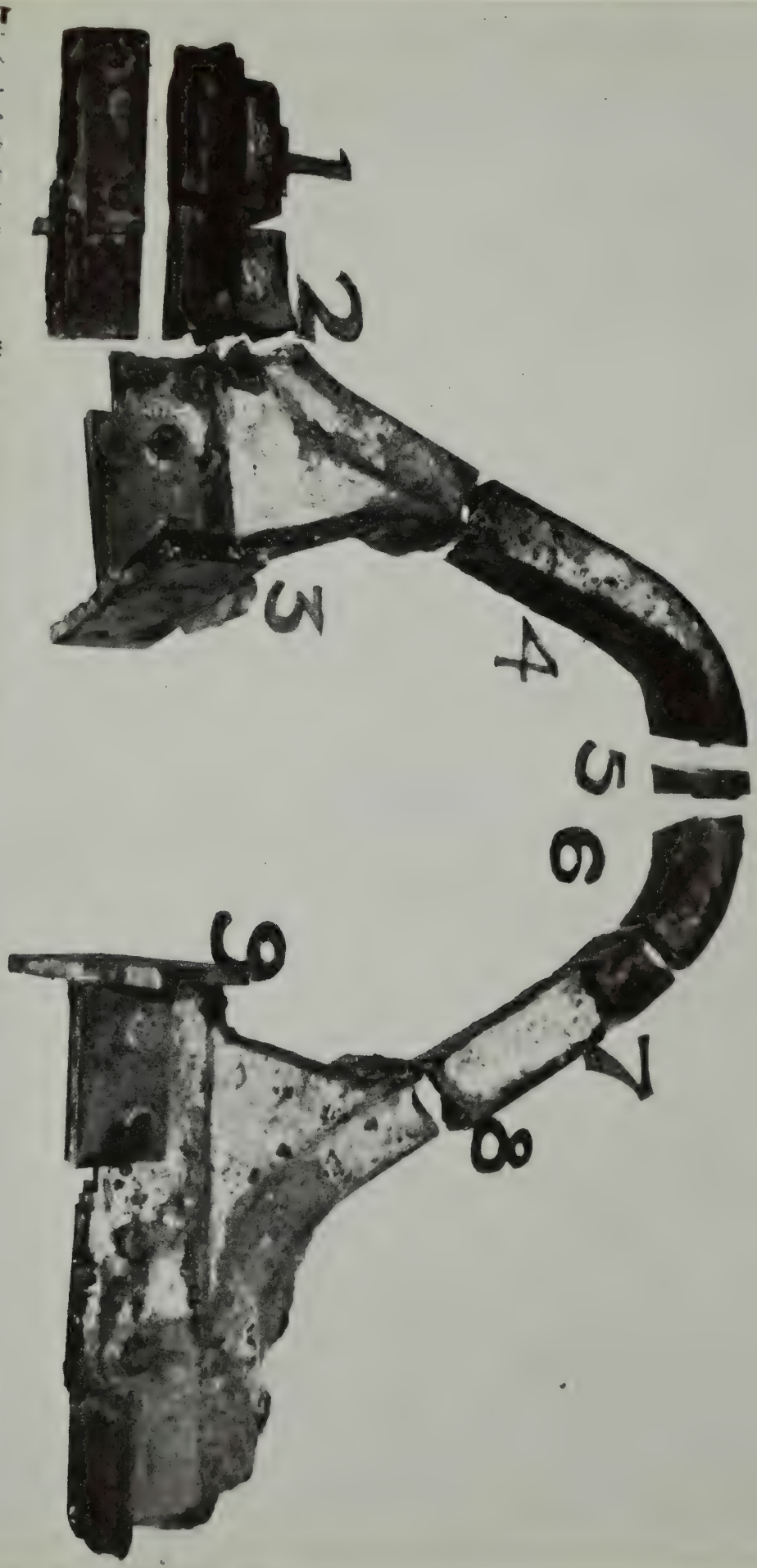


PHOTO 3- SAWED CROSS SECTION- RAIL, BRACKET AND FASTENERS
(LOCATION 1 ON PHOTO 2)

PHOTO 4-ETCHED CROSS SECTION-RAIL, BRACKET AND FASTENERS
(LOCATION 1 ON PHOTO 2)

PHOTO 5-SAWED CROSS SECTION- RAIL, BRACKET AND FASTENERS
(LOCATION 1 ON PHOTO 2)

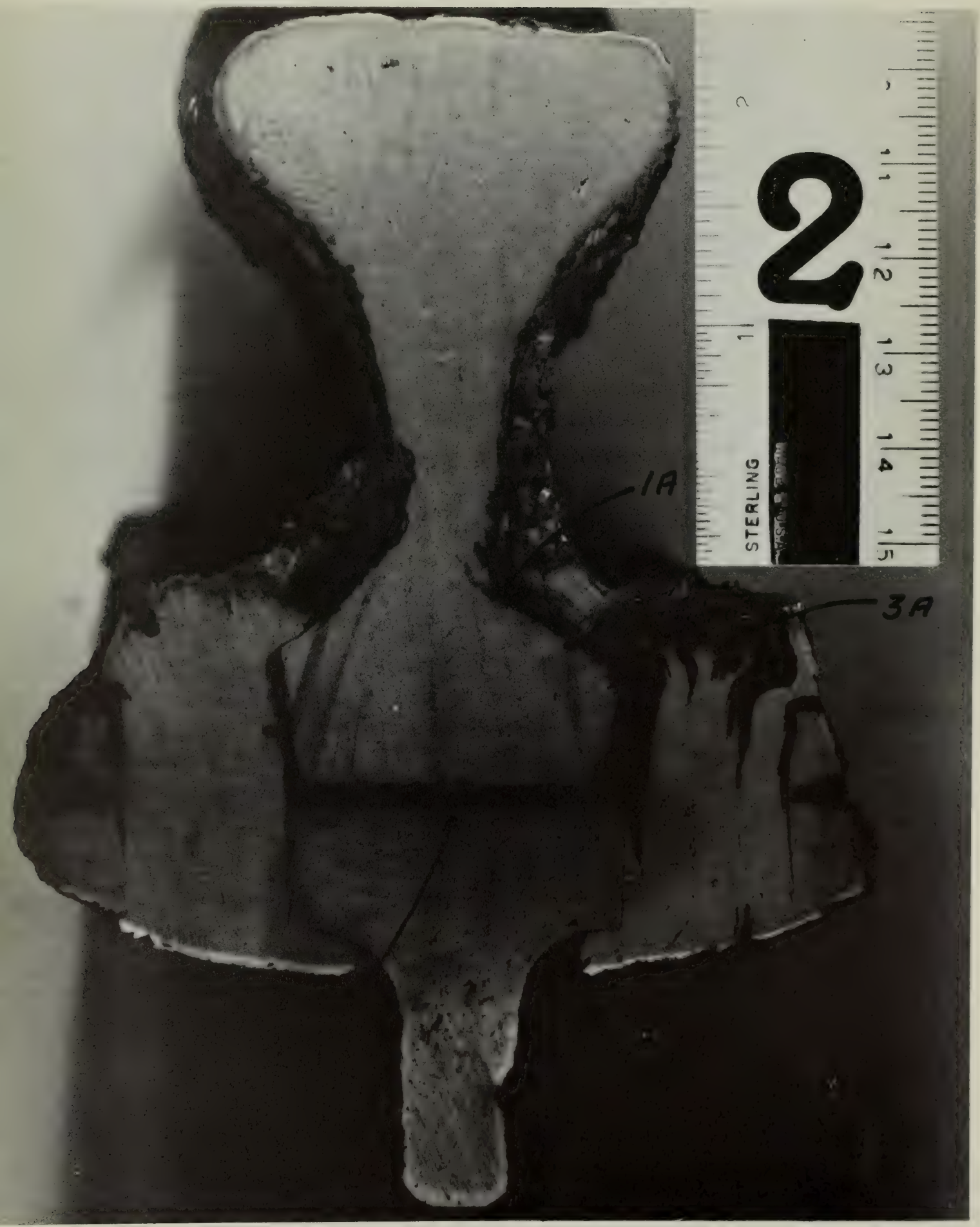


PHOTO 6-ETCHED CROSS SECTION- RAIL, BRACKET AND FASTENERS
(LOCATION 1 ON PHOTO 2)

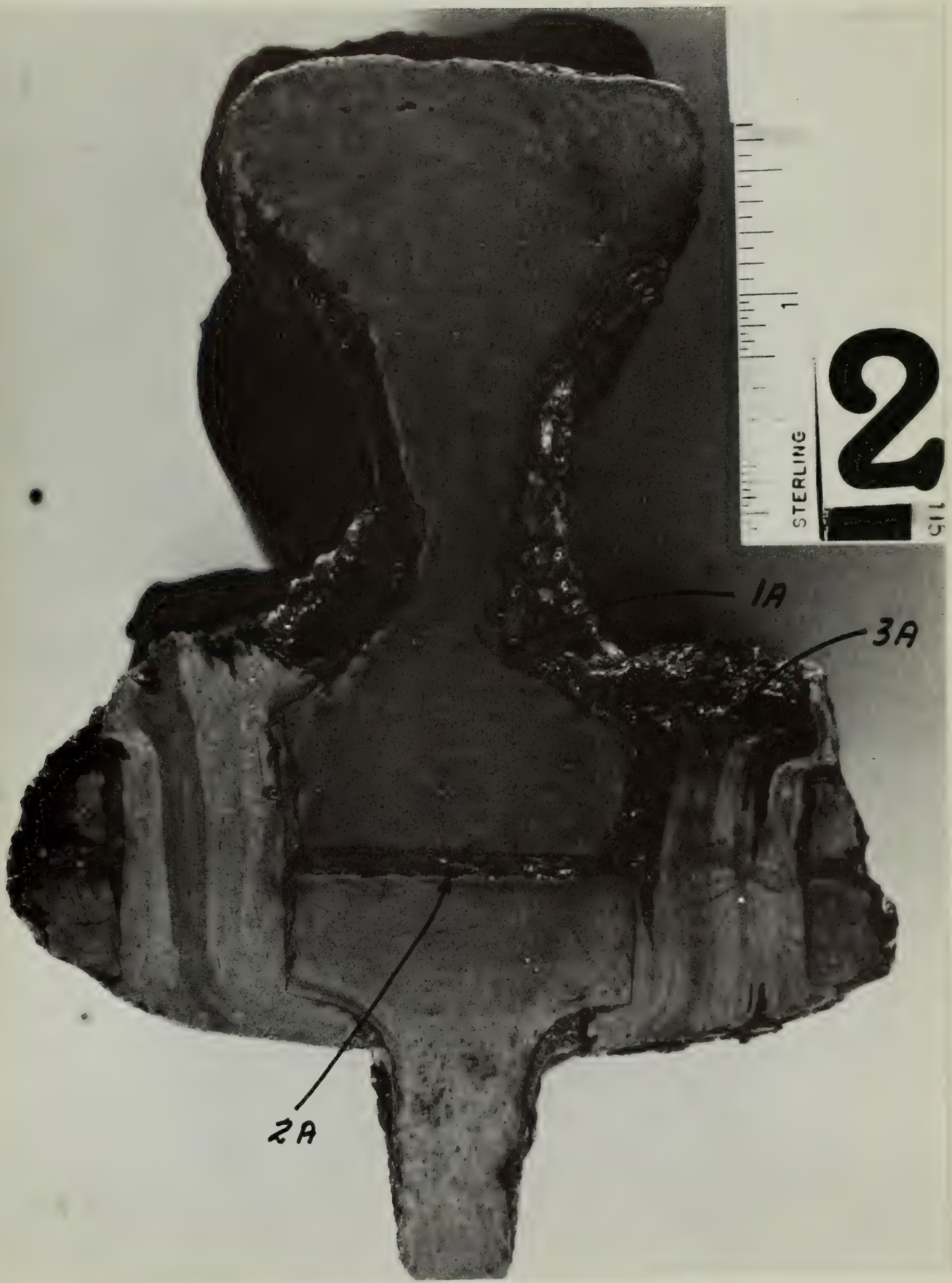


PHOTO 7- SAWED CROSS SECTION- YOKE FORMED FROM RAIL
(LOCATION 5 ON PHOTO 2)

PHOTO 8- ETCHED CROSS SECTION- YOKE FORMED FROM RAIL
(LOCATION 5 ON PHOTO 2)

PHOTO 9-SAWED CROSS SECTION-YOKE FORMED FROM RAIL
(LOCATION 7 ON PHOTO 2)

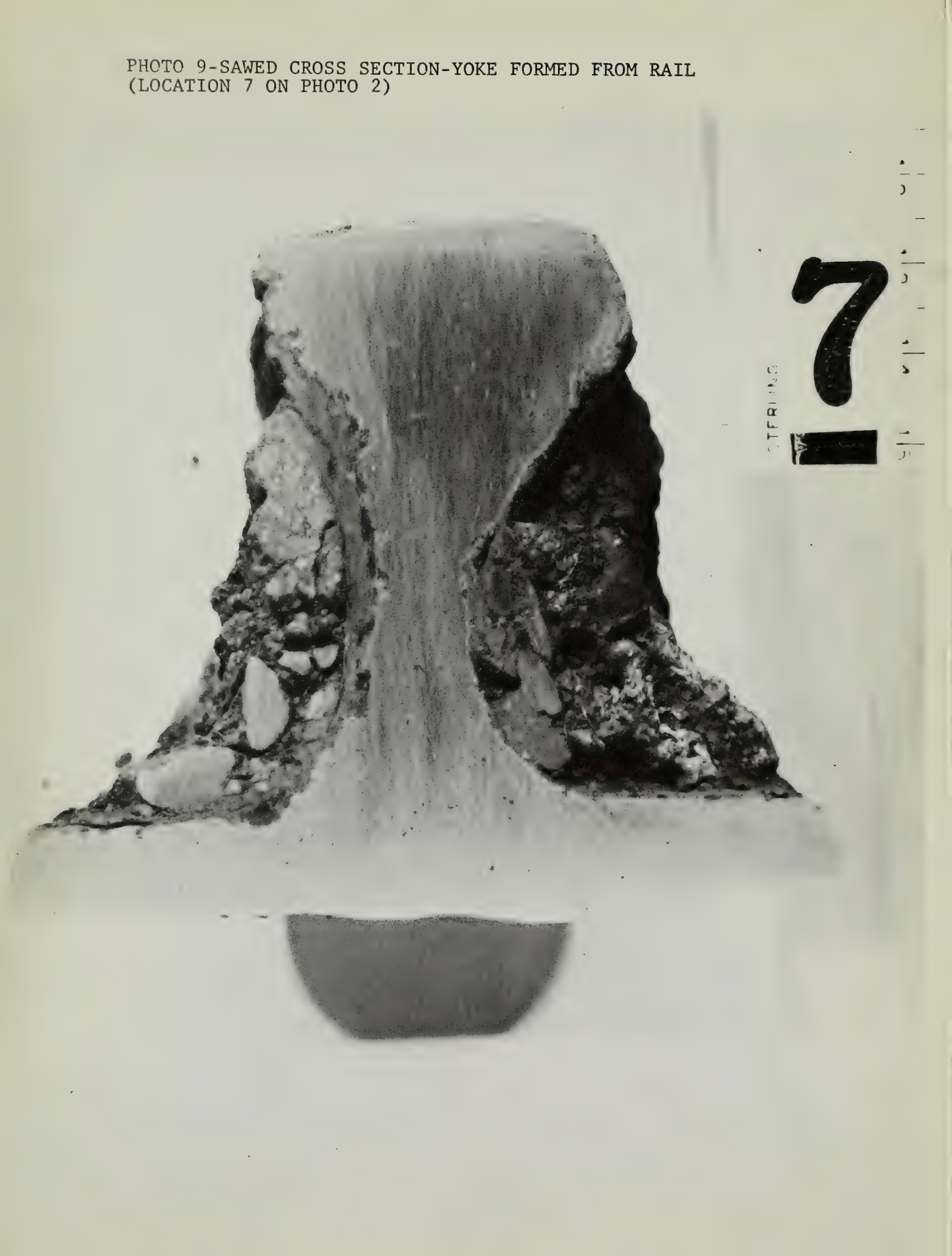
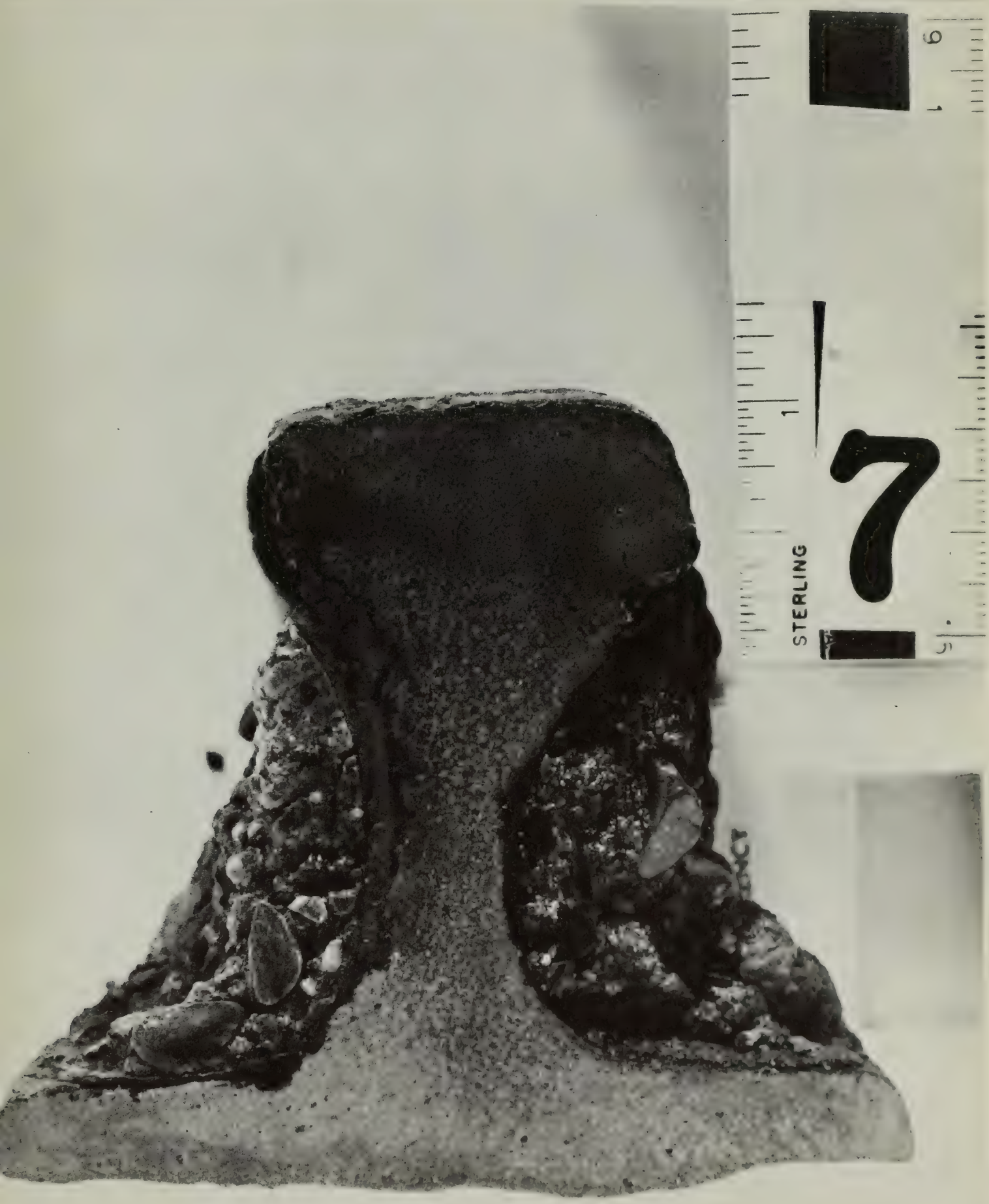


PHOTO 10-ETCHED CROSS SECTION - YOKE FORMED FROM RAIL
(LOCATION 7 ON PHOTO 2)



Attachment 2.2.B

HALES TESTING LABORATORIES

TESTING & INSPECTION SERVICES

...ORATORIES
OAKLAND
SAN JOSE
N FRANCISCO

REPLY TO
562-2773 - AREA CODE 415
P.O. BOX 2266
OAKLAND, CALIFORNIA 94621

April 9, 1979

LAB NO.: 61363 HTL NO.: OM 189-3

SUBJECT: Compressive Strength of Brick and Concrete Cores

PROJECT: CABLE CAR TRACK
San Francisco

DATE CORED: April 4 and 5, 1979

REPORT TO: Chin & Hensolt, Structural Engineers
182 Second Street
San Francisco, California 94105

RECEIVED
APR 10 1979
CHIN & HENSOLT
CONSULTING ENGINEERS

REPORT

Two (2) cores were cut by our technicians in the above named project. The core locations were selected by Mr. James Caid.

Both cores were brought to our laboratory where they were trimmed, capped and tested for compressive strength in accordance with ASTM: C42.

Results are as follows:

CORE NUMBER 1

Location: Mason Street, between Vallejo and Green Streets - 42" north of 3rd pulley box from intersection of Mason and Green in northbound track.

Core Dimensions: 8" dia. x 18-7/8" and 6" dia. x 18"

Core Tested: 8.02" dia. x 8.70" Brick with Flat Side

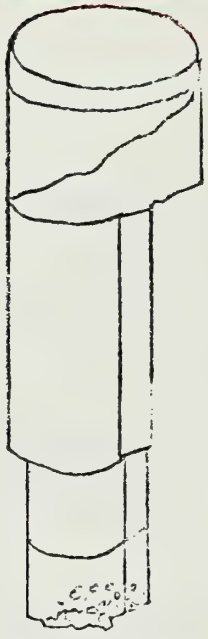
Remarks: This composite core consists of 2" of asphalt concrete, 5-1/2" of red brick and concrete, 18-1/8" of red brick and 11-1/4" red rock concrete. The lower 29-3/8" length of core had a flat side; the wall edge was within the core. The core was removed in seven (7) sections. The lower 11-1/4" consists of red rock concrete with voids

TO: Chin & Hensolt, Structural Engineers

CORE NUMBER 1 (Continued)

Remarks: and rock pockets and was removed in two (2) sections. A section of the 8" diameter red brick core was tested for compressive strength.

Compression Strength: 1840 psi



Asphalt Concrete 8" Dia. x 2"

Red Brick/Concrete 8" Dia. x 5-1/2"

Red Brick 6" Dia. x 11-3/8"

Red Brick 6" Dia. x 6-3/4"

Red Rock Concrete 6" Dia. x 11-1/4"

CORE NUMBER 2

Location: Mason Street between Vallejo and Green Streets - 3rd cable pulley access port south of the Mason-Green Streets intersection.

Dimensions: 6" dia. x 11-1/2"

Dimensions of Core Tested: 5.89" dia. x 10.15" (trimmed & capped)

Remarks: This red rock concrete core appeared dense and well consolidated.

Compression Strength: 3040 psi

Respectfully submitted,
HALES TESTING LABORATORIES

Xavier Victoria

XV/rr
2c:

Xavier Victoria

HALES TESTING LABORATORIES

TESTING & INSPECTION SERVICES

LABORATORIES
OAKLAND
SAN JOSE
AN FRANCISCO

REPLY TO
562-2773 - AREA CODE 415
P.O. BOX 2266
OAKLAND, CALIFORNIA 94621

April 16, 1979

HTL NO.: OM 189-3

Chin & Hensolt, Structural Engineers
182 Second Street
San Francisco, California 94105

SUBJECT: CABLE CAR TRACK
San Francisco

Gentlemen:

Transmitted herewith are photos for the above named project which should be attached to the report dated April 9, 1979, Lab No. 61363.

Respectfully submitted,

HALES TESTING LABORATORIES

Xavier Victoria

Xavier Victoria

XV/rr
2c:

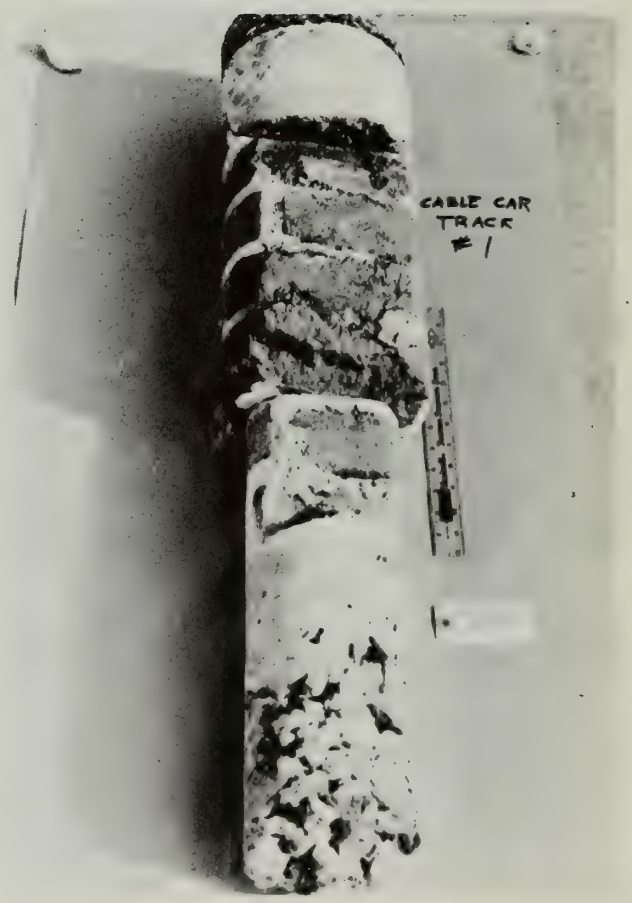
RECEIVED
APR 17
CHIN & HENSOLT
CONSULTING

HALES TESTING LABORATORIES

Attachment One (1)
HTL NO.: OM 189-3
LAB NO.: 61363
April 9, 1979

TO: Chin & Hensolt, Structural Engineers

Core No. 1

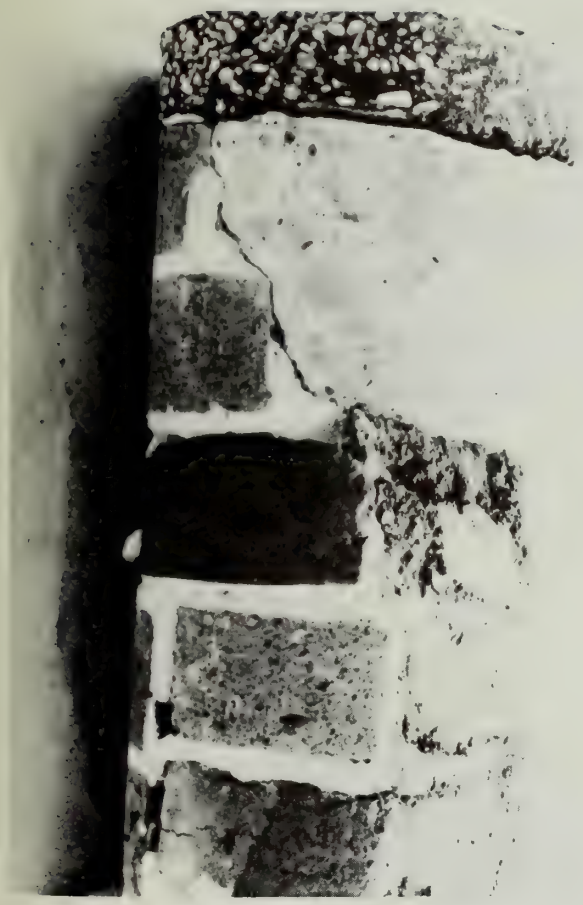


Core No. 1 - Other side of core.

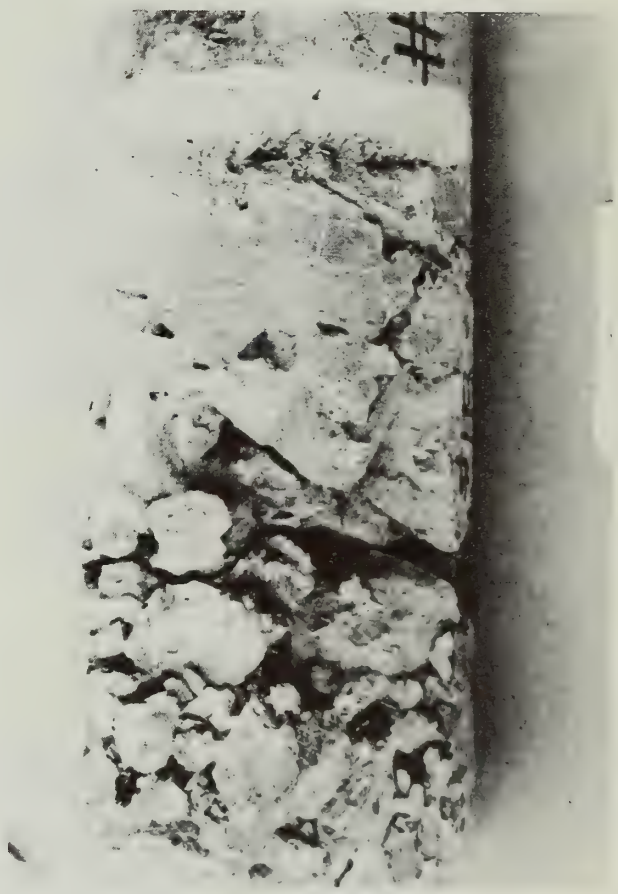
HALES TESTING LABORATORIES

Attachment Two (2)
HT NO.: OM 189-3
LAb NO.: 61363
April 9, 1979

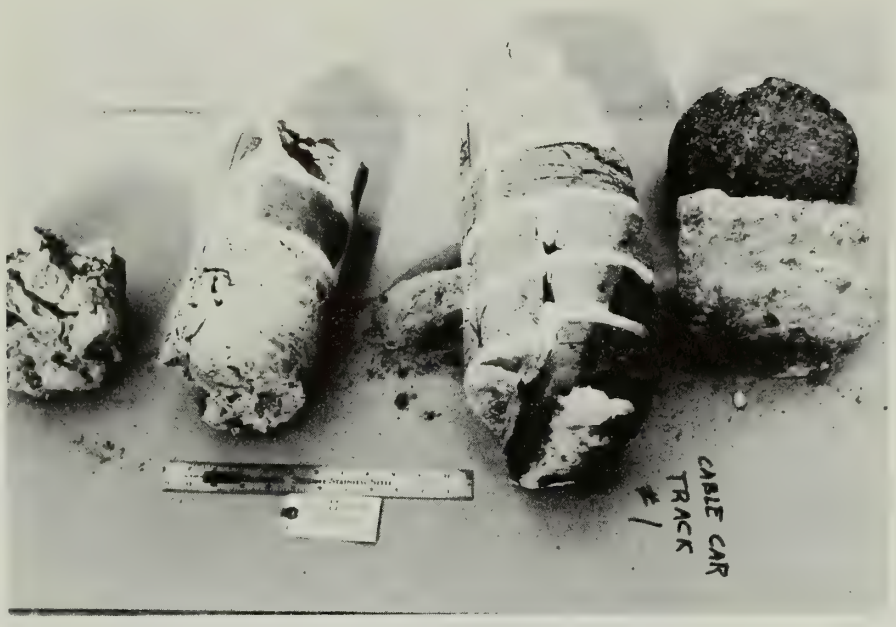
TO: Chin & Hensolt, Structural Engineers



Top of Core No. 1.



Bottom of Core No. 1.



Core No. 1 as removed.

Core No. 2 - Red rock concrete.

Attachment 2.2.C

PHONE (415) 939-1910

FORD ASSOCIATES
METALLURGICAL ENGINEERING CONSULTANT

3100 LA PLAYA COURT
LAFAYETTE, CALIFORNIA 94549

February 28, 1979

Mr. Richard Baker, Vice President
Chin & Hensolt
Consulting Engineers
182 Second Street
San Francisco, Ca. 94105

Dear Mr. Baker:

This report includes sampling of five parts removed from five underground sites that were excavated to determine the present condition of the substructure. The locations of these sites are included along with the description of the piece as originally installed wherever possible. It should be noted that the type of corrosion found here was prevalent on other parts of the substructure to varying degrees and these samples are considered average for the site examined.

Following are the sites and description of the part removed and replaced, or found to be no longer part of the substructure due to extensive corrosion in areas around the part sampled in this report.

Initially a sample was removed from the location at Mason and Filbert and another sample was removed from a second location at Lombard and Columbus. Both samples were removed from a vertical outside section of the yoke approximately 7" below the top of the yoke as shown in Drawing AL-2381 "Typical Yoke - Powell Street type- cable track construction" revised 2-13-51. This vertical section was originally a 2 1/2" x 2 1/2" x 3/8" angle.

Photo 1 was taken from the Lombard and Columbus location and sectioned horizontally to determine the amount of sound metal remaining under the scale appearing on the surface. The sample was first mounted in plastic so sectioning would not cause undue fracturing. Note that the corrosion effect

was throughout the entire cross section of the sample. The strength of the remaining structure has been greatly reduced by such corrosive action.

Photo 2 shows a sample taken from the same area of the outside vertical member as in Photo 1, except Photo 2 is a sample taken from the location at Mason and Filbert. Again the sample was mounted prior to sectioning. Note in Photo 2 the light appearing area in the lower left hand area of the sectioned sample. That small light area is what is left of the good sound metal in the original 2 1/2" x 2 1/2" x 3/8" angle. The dark appearing areas surrounding the good metal are corrosion products or "rust". Again the structural strength of this member is minimal.

Subsequent sites were located at Powell and Geary and Powell and Ellis. A fastener and an angle section were removed from the Powell and Geary location and an angle section from Powell and Ellis location. The general corrosion problem again existed in these locations with certain samples showing a much higher degree of corrosive attack than others, but no definite corrosion pattern existed relative to their location in the structure.

In order to better illustrate the extent of the corrosion some photos were taken in color. Photos 3 thru 7 show the exterior condition of the fastener (Powell and Geary). Note the overall corrosion plus the tapered end where corrosion had progressed completely thru the cross section. This fastener was then sectioned longitudinally. Photo 8 shows the fastener prior to sectioning and Photo 9 shows the longitudinal section. Note the dark areas. They are sites where corrosion occurred throughout the cross section of the washer. Also note the area at the threaded interface of shank and nut. While corrosion existed here to a lesser extent than in the washer area, the effective strength of the interface area has to be greatly reduced due to corrosion present in this critical load bearing area.

The angle removed from Powell and Geary was checked at two locations for thickness variation. See Sketch 1. Originally

this was a 2" x 2" x 1/4" angle. Extensive corrosion was found near the junction of the legs of the angle as noted by the thicknesses of .175", .196" and .202", .181", .175" and .227". The corrosion layer already removed by weathering from this area ranged from 5% to 51% of the original thickness. The sound metal remaining under the corrosive scale still adhering to the surface of the angle varied from .156" to .188", thus indicating a loss of original sound metal of .094" to .062". Expressed as a percentage of original thickness, the sound metal remaining was 62 to 75%. See Photos 10 thru 15.

The angle removed from the Powell and Ellis location was so badly corroded dimensional checks to determine the amount of sound metal remaining were deemed not feasible. Photos 16 thru 18 show the view of the angle. Note the bolt hole originally put in the angle is corroded to the extent no contact area remains on the edge of the hole for approximately 80 degrees. Photo 19 shows a closeup view of this condition. A section was taken thru the section shown in Photo 19 to illustrate the lip of the angle. Photo 20 shows the end view of this section. Photo 21 shows a weld deposit was made directly above the remaining solid metal in Photo 22, and this had been attacked by corrosion and has nearly disappeared.

Conclusion:

1. The extent of corrosion on all components examined, regardless of location from which the sample was obtained, indicate the components to be in very poor condition.
2. From a standpoint of load carrying capability it is extremely doubtful that any of the components examined can sustain loads for which they were originally designed. Not only because the corrosion is so extensive, but also because the corrosion is so non-uniform in nature thus developing extremely thin sections of sound metal in certain areas compared to other areas.

If there are any questions you may have concerning this report, please let me know.

Sincerely yours,

ROBERT G. FORD
Professional Engineer
State of California
Cert. #MT863
Cert. #MF2535

RGF/ekf

SKETCH 1 POWELL AND GEARY- 2"x2"x1/4" ANGLE-
THICKNESS MEASUREMENTS ON EACH LEG
OF ANGLE

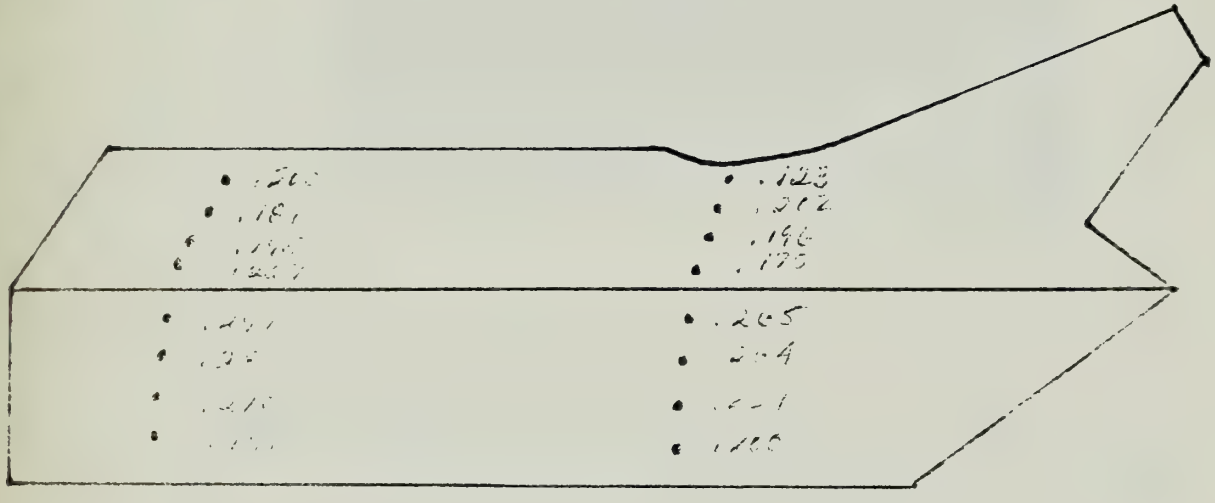


PHOTO 1 LOMBARD AND COLUMBUS-CORRODED THRU CROSS SECTION-2 1/2"x 2 1/2"x 3/8" ANGLE

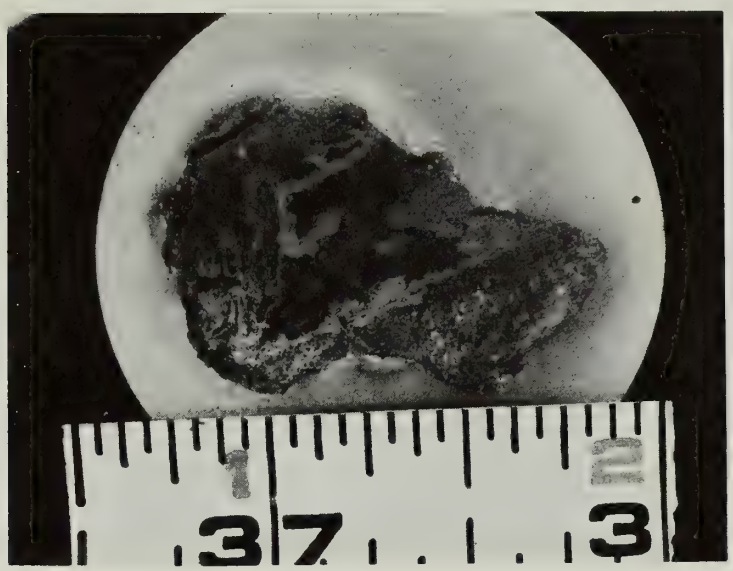


PHOTO 2 MASON AND FILBERT - LIGHT AREA SOUND METAL-2 1/2"x 2 1/2"x 3/8" ANGLE

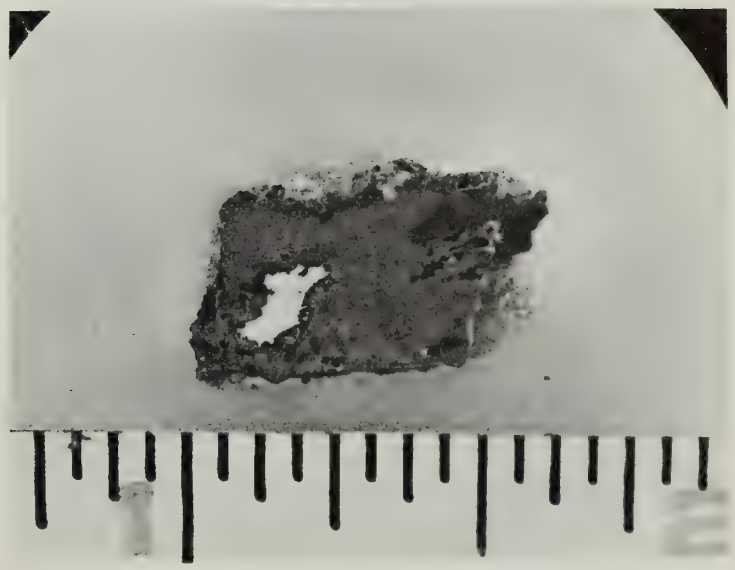


PHOTO 3 POWELL AND GEARY- FASTENER

PHOTO 4 POWELL AND GEARY FASTENER

PHOTO 5 POWELL AND GEARY - FASTENER

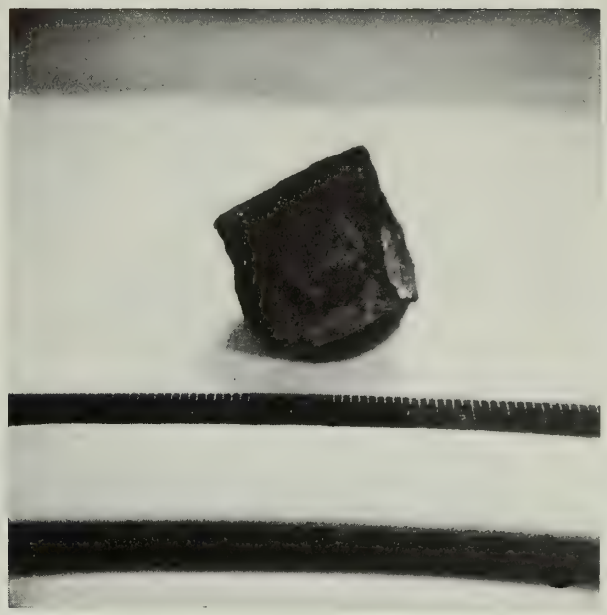


PHOTO 6 POWELL AND GEARY- FASTENER

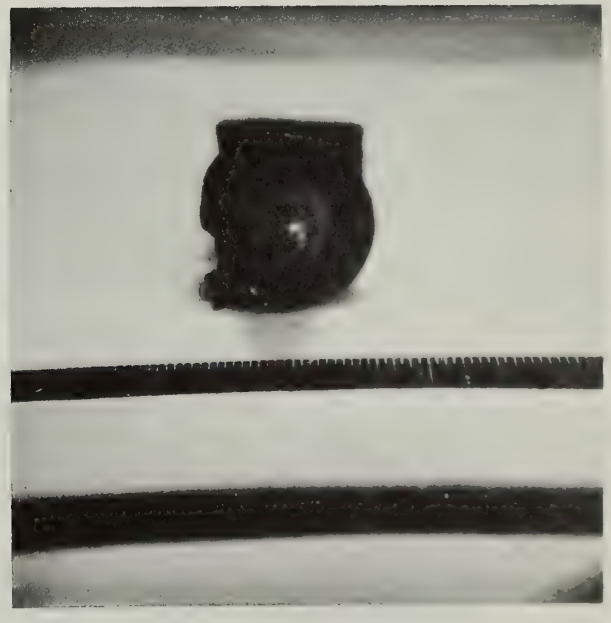


PHOTO 7 POWELL AND GEARY - FASTENER

PHOTO 8 POWELL AND GEARY - FASTENER PRIOR TO SECTIONING

PHOTO 9 POWELL AND GEARY - FASTENER SECTIONED LONGITUDINALLY THRU CENTER LINE

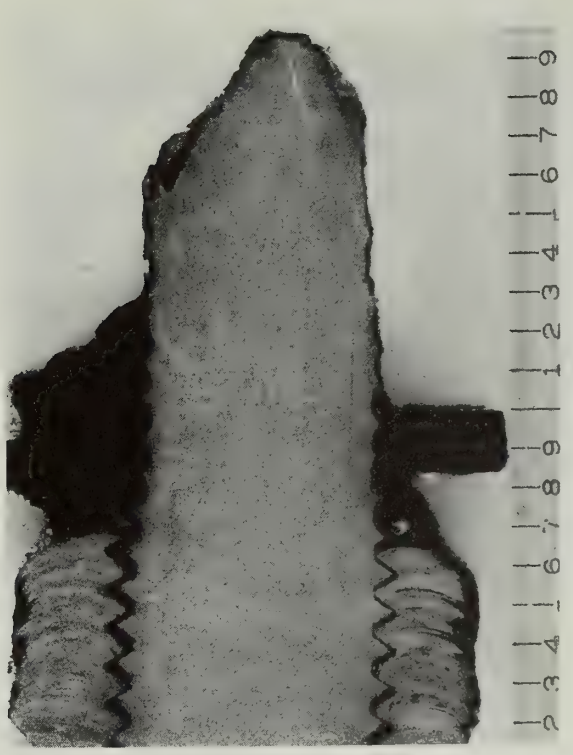


PHOTO 10 POWELL AND GEARY- 2"x2"x1/4" ANGLE

PHOTO 11 POWELL AND GEARY- 2"x2"x1/4" ANGLE

PHOTO 12 POWELL AND GEARY- 2"x2"x1/4" ANGLE

PHOTO 13 POWELL AND GEARY- 2"x2"x1/4" ANGLE

PHOTO 14 POWELL AND GEARY- 2"x2"x1/4" ANGLE

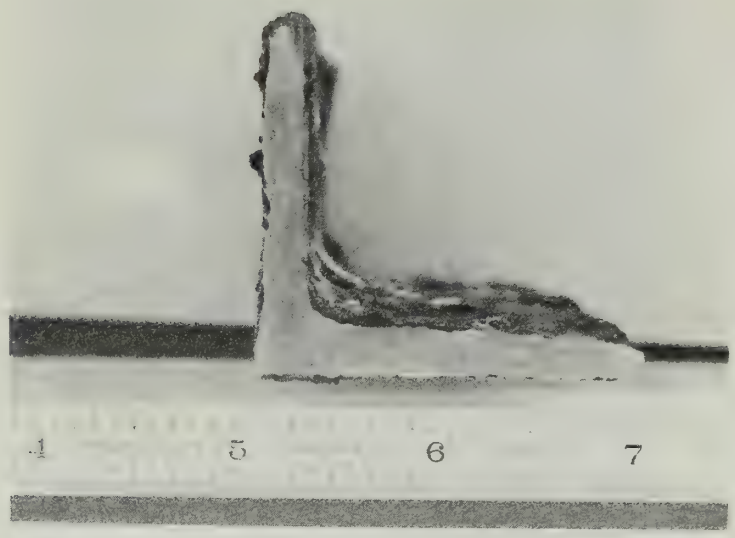


PHOTO 15 POWELL AND GEARY- 2"x2"x1/4" ANGLE

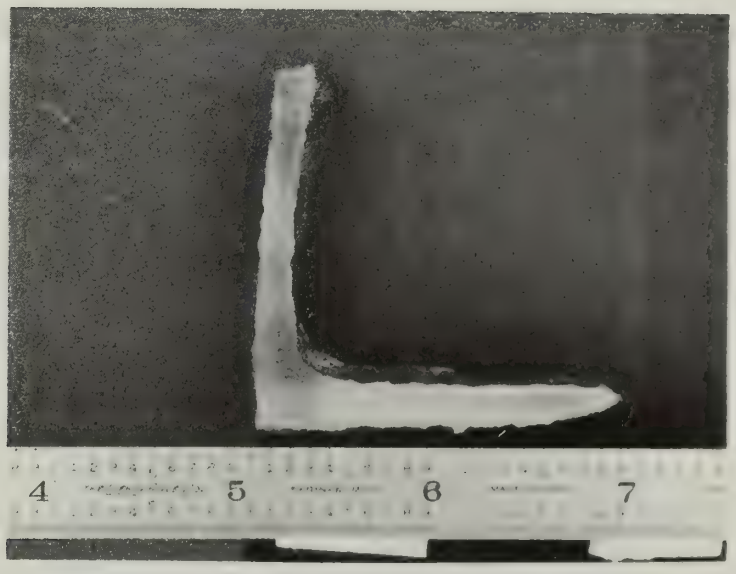


PHOTO 16 POWELL AND ELLIS -ANGLE WITH BOLT HOLE AND WELD BEAD DEPOSIT

PHOTO 17 POWELL AND ELLIS-ANGLE WITH BOLT HOLE AND WELD BEAD DEPOSIT

PHOTO 18 POWELL AND ELLIS-ANGLE WITH BOLT HOLE AND WELD BEAD DEPOSIT

PHOTO 19 POWELL AND ELLIS-RED LINE DENOTES AREA CUT TO PREPARE CROSS SECTION IN PHOTO 20

PHOTO 20 POWELL AND ELLIS- CROSS SECTION OF PHOTO 19- NOTE VARIATION OF CORRODED LAYER AND WELD BEAD DEPOSIT

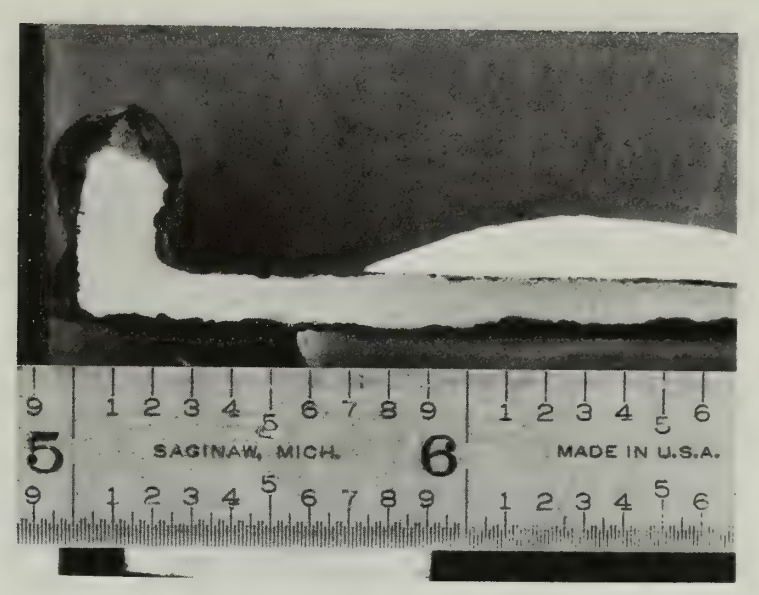
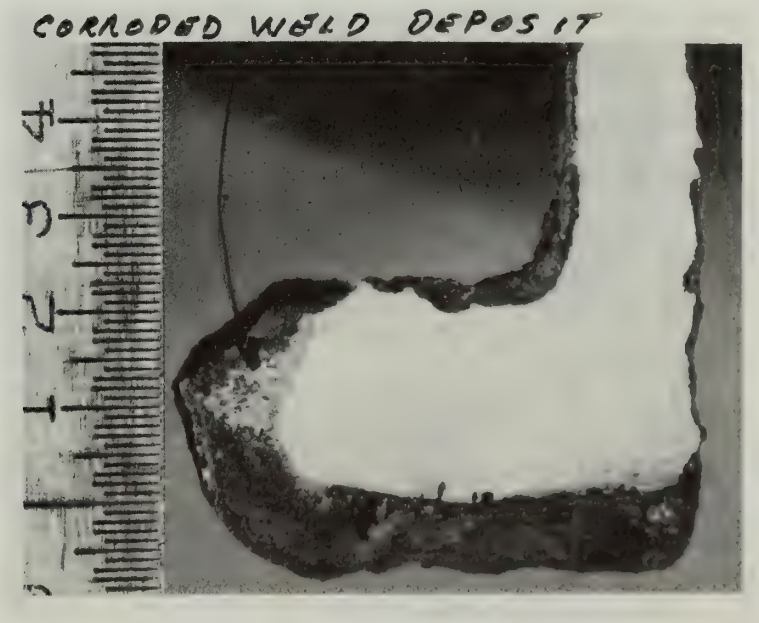


PHOTO 21 POWELL AND ELLIS- NOTE DEGREE OF CORROSION VARIATION AND CORROSION IN WELD BEAD



Section 2.3

SHEAVE AND TURNTABLE PITS

Ten sheave pits and three turntable pits are currently in use in the trackway. The sheave pits are located at or near the intersections of California and Drumm sts, California and Mason sts, California and Hyde sts, California St and Van Ness Av, Hyde and Pacific Av, Hyde and Beach sts (two, one in Victorian Park), Bay and Taylor sts, Powell and Market sts, and Powell and Washington sts. The turntable pits are at Victorian Park, Bay and Taylor sts, and Market and Powell sts. The Victorian Park and Market/Powell turntable pits are adjacent to the sheave pits at these locations; in 1941 the Bay/Taylor turntable was moved from the intersection of the streets next to the sheave pit 30 ft south on Taylor St.

2.3.1 Description

California and Drumm Sheave Pit

Brick construction, with some concrete and steel beams. Duplex sump pump for drainage. Access through hatch down perpendicular metal ladder anchored to wall. About 2100 cu ft.

California and Mason, California and Hyde, California and Van Ness, Hyde and Pacific, Hyde and Beach Sheave Pits (see Figures 2.3.a, b, c, d, e).

All built about 1957. Concrete, with steel beams in ceilings. Drainage by gravity. Access through hatches down metal perpendicular ladders anchored to wall. Each is about 1500 cu ft.

Victorian Park Sheave and Turntable Pits (see Figure 2.3.f).

Constructed about 1957. Concrete with steel beams in ceilings. Access to sheave pit through hatch and down perpendicular metal ladder anchored to wall. Drainage by gravity. Access to turntable pit through hatch in turntable deck; no ladder -- turntable frame is used for footholds. Pits separated by concrete wall, with openings for passage of cable. Sheave pit, about 1800 cu ft; turntable pit, about 2800 cu ft, just large enough to house turntable.

Bay and Taylor Sheave Pit (see Figure 2.3.g).

Brick construction, with steel beams in ceiling; ceiling repaired with concrete in 1961. Drainage by gravity, but bottom of pit below high tide. Access through manhole, down perpendicular metal ladder anchored to wall. About 1300 cu ft.

Bay and Taylor Turntable Pit (see Figure 2.3.h).

Concrete. Drainage by gravity. Access through hatch in turntable deck, no ladder. About 1800 cu ft.

Powell and Market Sheave and Turntable Pits

Brick, with steel beams in sheave pit ceiling. Drainage by gravity. Pits connected by passageway. Access to both through hatch, down perpendicular metal ladder anchored to wall; also hatch in turntable deck. Sheave pit, about 1200 cu ft; turntable pit, about 2800 cu ft.

Powell and Washington Sheave Pit

Brick vaulted construction, with steel beams in ceiling. Contains three sheaves, two of which were for incoming Powell line and outgoing Mason line cable and are no longer in use. Access through hatch, down perpendicular metal ladder anchored to wall, or through tunnel from sheave room at barn. Drainage received from barn sheave room through tunnel empties into storm sewer through drain in pit. About 4000 cu ft.

2.3.2 Inspection

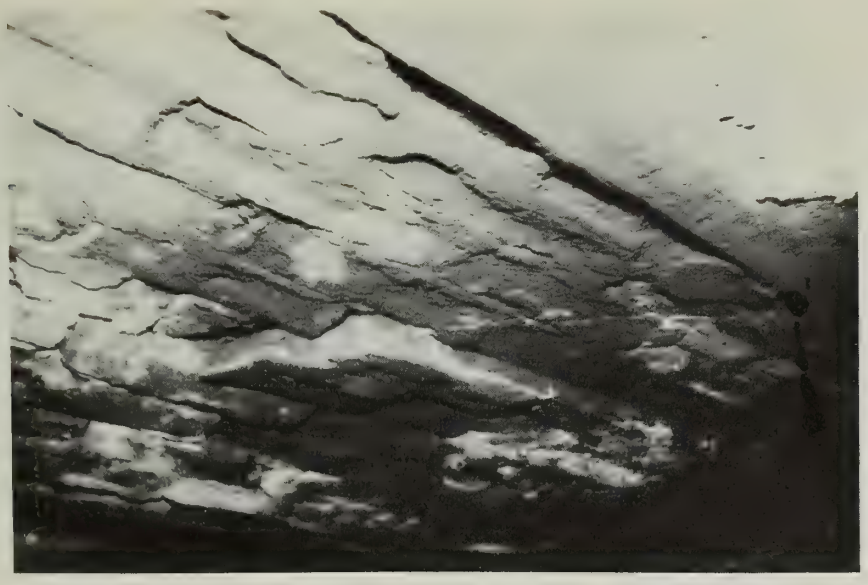
Brick walls in the pits at Drumm and Market, Bay and Taylor (sheave), Powell and Market, and Powell and Mason are unreinforced and mortar joints have disintegrated; the ceiling of the California and Drumm pit is failing and the brickwork is fractured. Beams in all are badly corroded. No structural

deterioration was apparent in the other pits, but beams are beginning to corrode. Exposed electrical wires were found in the California and Van Ness and Victorian Park (turntable) pits, and the lights were out at Hyde and Pacific, Hyde and Beach, Victorian Park (turntable), and Bay and Taylor (sheave). Drainage is inadequate as a result of poor maintenance.

2.3.3 Evaluation

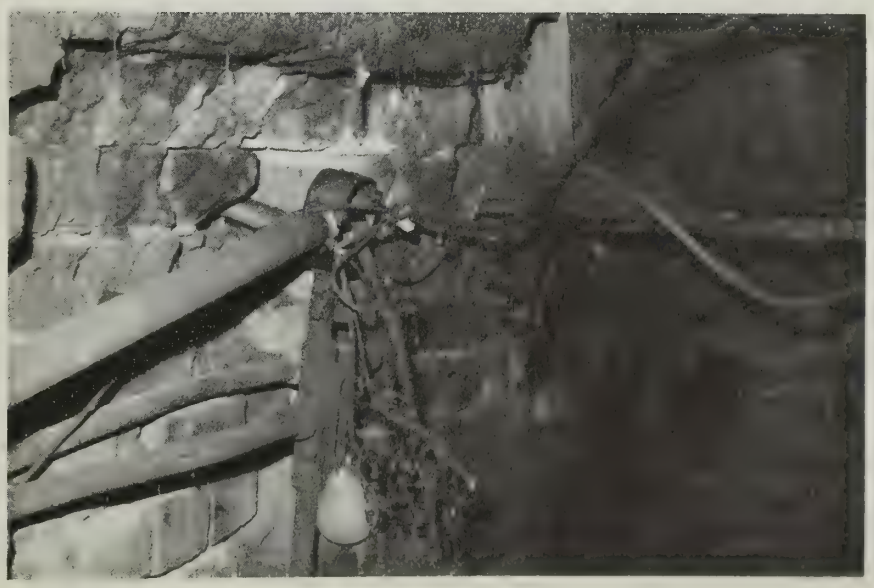
The Drumm and Market, Bay and Taylor (sheave), Powell and Market, and Powell and Mason pits are structurally unsound. The rest are sound structurally, but roofs should be reconstructed to eliminate rusted beams and provide adequate access for sheave maintenance. Metal ladders are unsafe, because they tend to be slippery, are difficult to enter or leave at the street level -- which is just below the hatch entrance -- and provide inadequate support for a workman carrying equipment. Pits are so confined that they cannot be entered for inspection or maintenance while system is in operation. Lighting is inadequate for access and to perform maintenance operations.

Illustrations



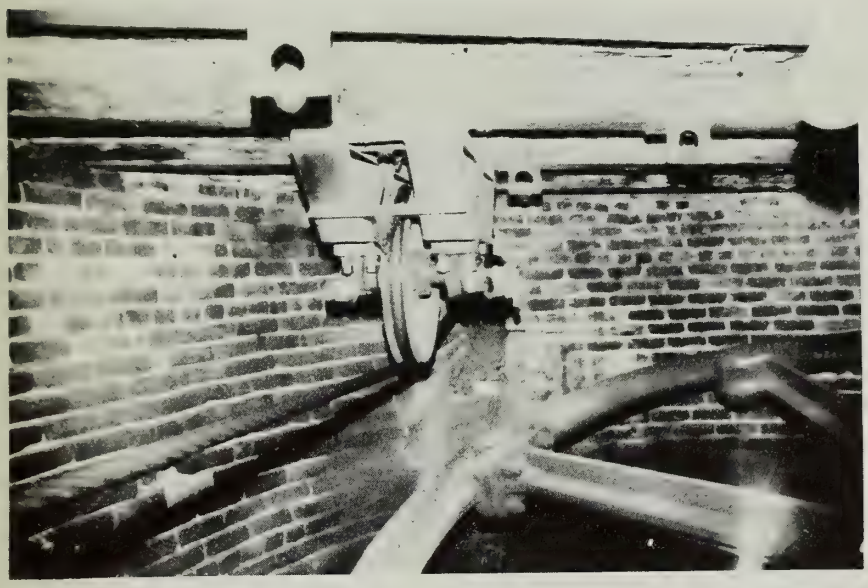
Ceiling of California and Drumm sheave pit.

Disintegrating walls of Bay and Taylor sheave pit, with board shoring up roof.

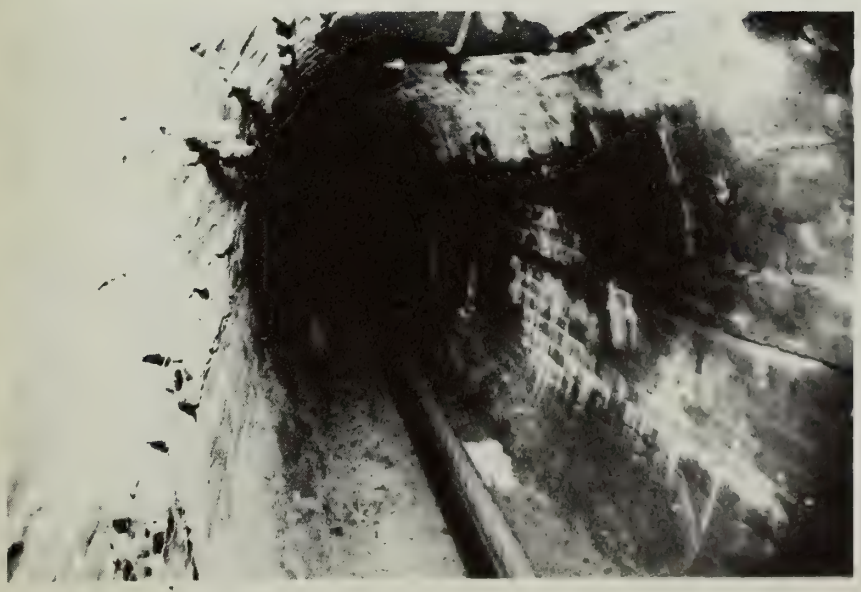


Light fixture and loose bricks in Powell and Market turntable pit.

Collapsed wall around rim anchor of Powell and Market turntable.



Vaulted construction of Powell and Washington sheave pit.



Tunnel from car barn to Powell and Washington sheave pit.

Figures

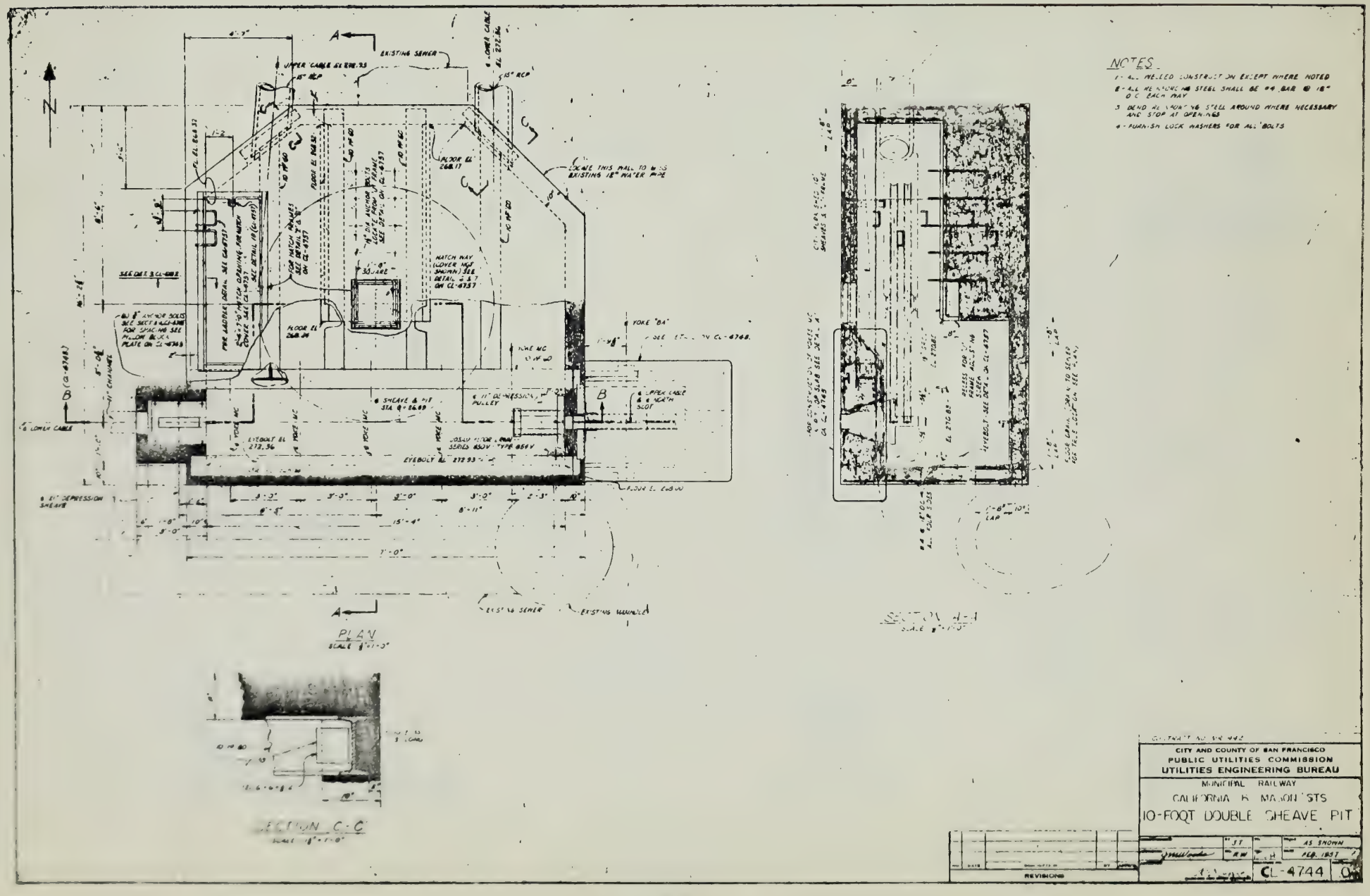

NOTES
PLAN
SECTION C-C
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY
CALIFORNIA & MASON STS
10-FOOT DOUBLE SHEAVE PIT
CL-4744

FIGURE 2.3.a

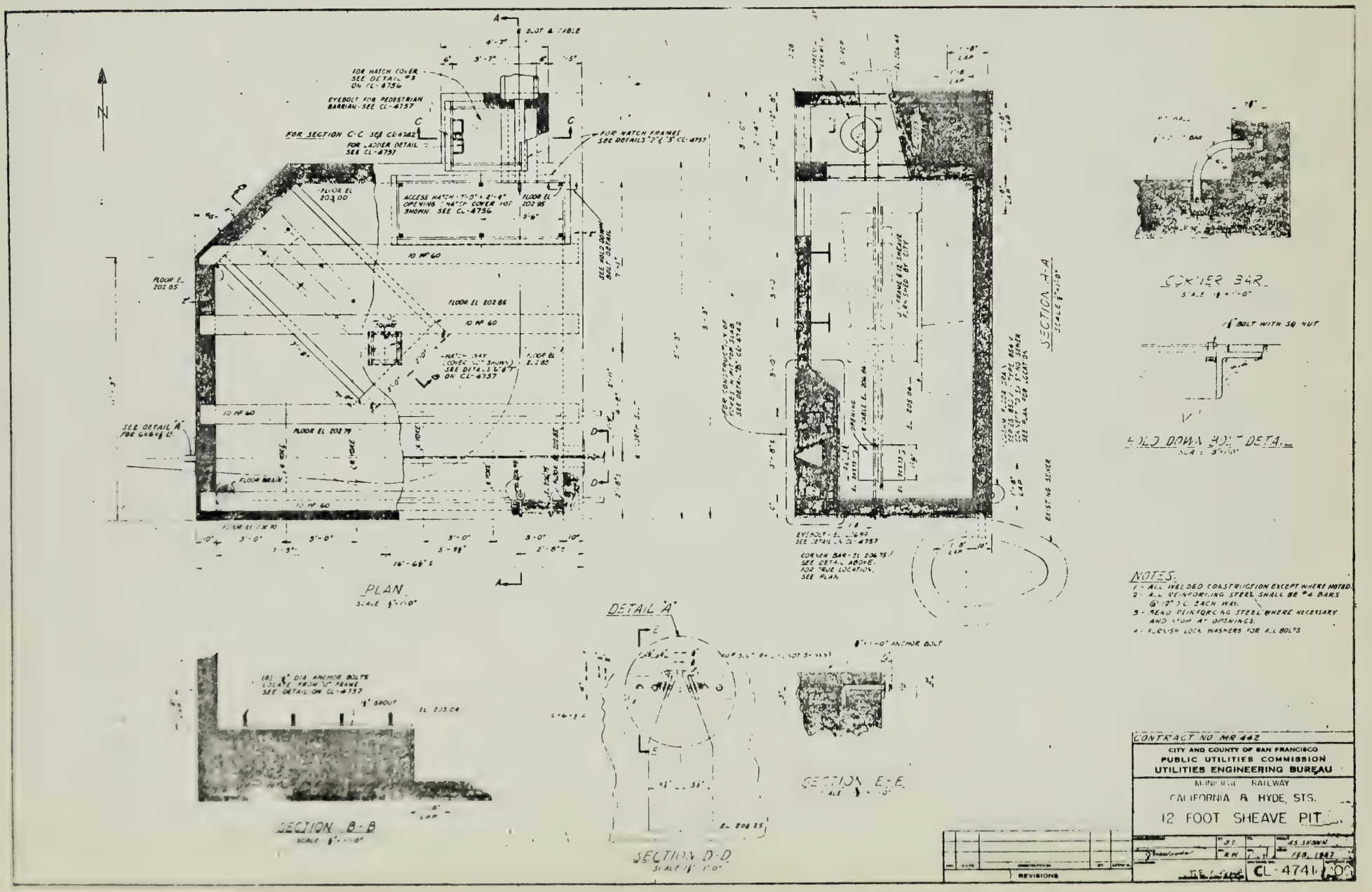

PLAN
SECTION A-A
SECTION B-B
SECTION D-D
SECTION E-E
DETAIL "A"
COVER BAR
4 KD DOWN BOLT DETAIL
NOTES.
1 - ALL WELDED CONSTRUCTION EXCEPT WHERE NOTED.
2 - ALL REINFORCING STEEL SHALL BE #4 BARS @ 12" O.C. EACH WAY.
3 - BEND REINFORCING STEEL WHERE NECESSARY AND STOP AT OPENINGS.
4 - FLUSH LOCK WASHERS FOR ALL BOLTS
CONTRACT NO MR 442
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNI RAILWAY
CALIFORNIA & HYDE STS.
12 FOOT SHEAVE PIT
CL-4741
REVISIONS

FIGURE 2.3.b

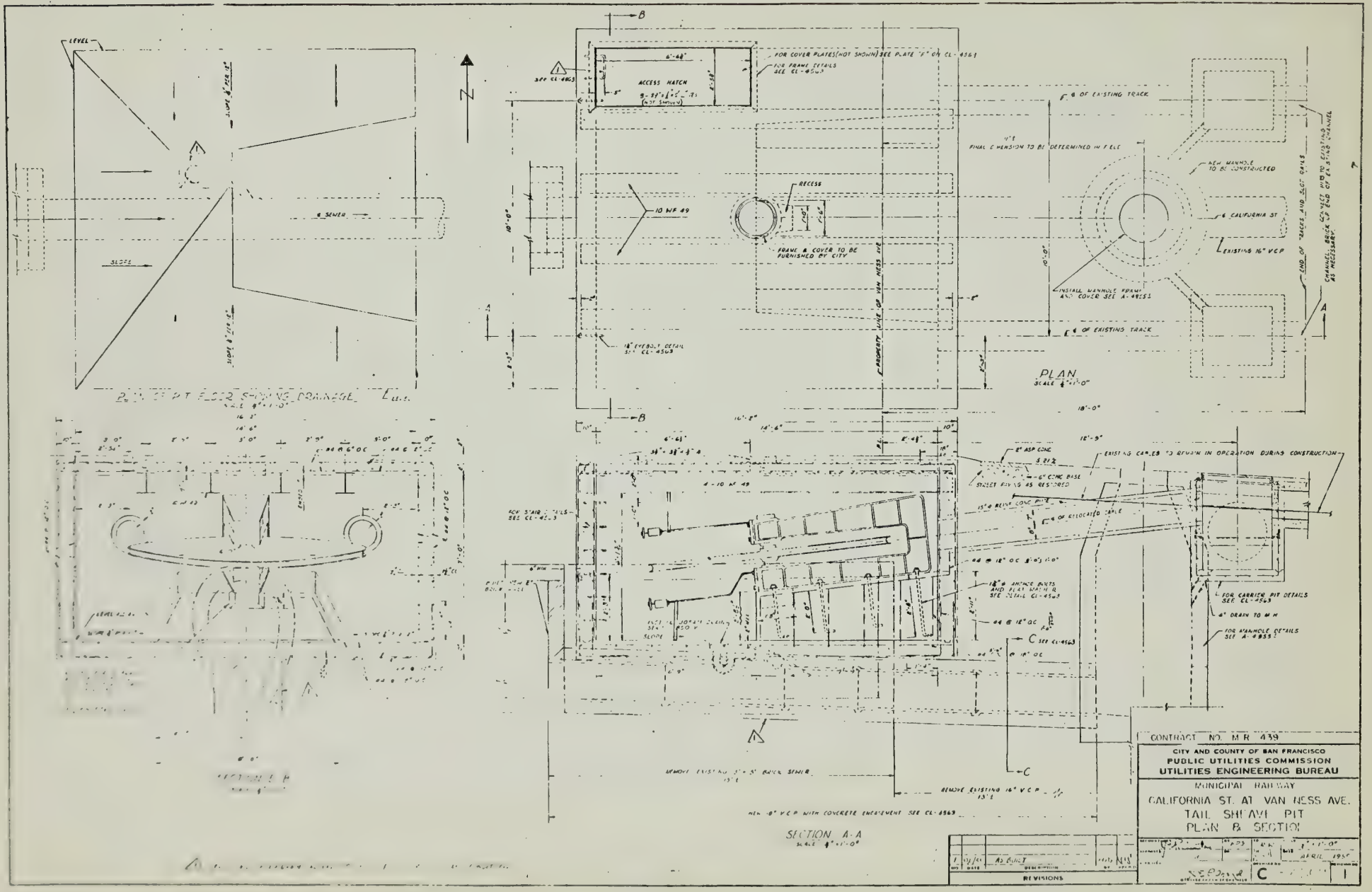

PLAN
SECTION A-A
CONTRACT NO. M R 439
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY
CALIFORNIA ST. AT VAN NESS AVE.
TAIL SHEAVE PIT
PLAN & SECTION
REVISIONS

FIGURE 2.3.c

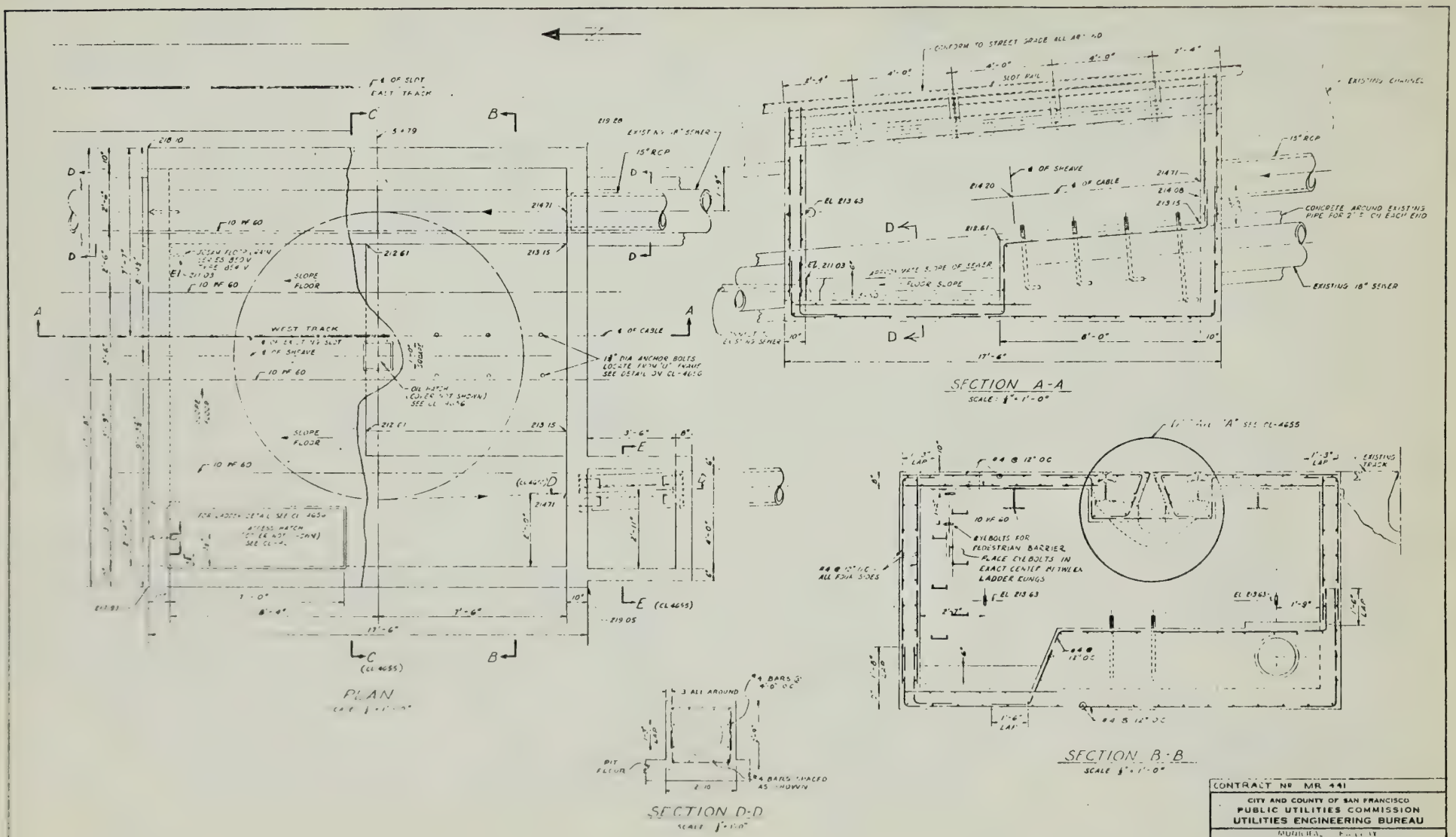

PLAN
SECTION A-A
SECTION B-B
SECTION D-D
CONTRACT NO MR 441
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
HYDE ST NORTH OF JACKSON ST.
12' SHEAVE
PLAN AND SECTIONS
CL 4654 1
REVISIONS

FIGURE 2.3.d

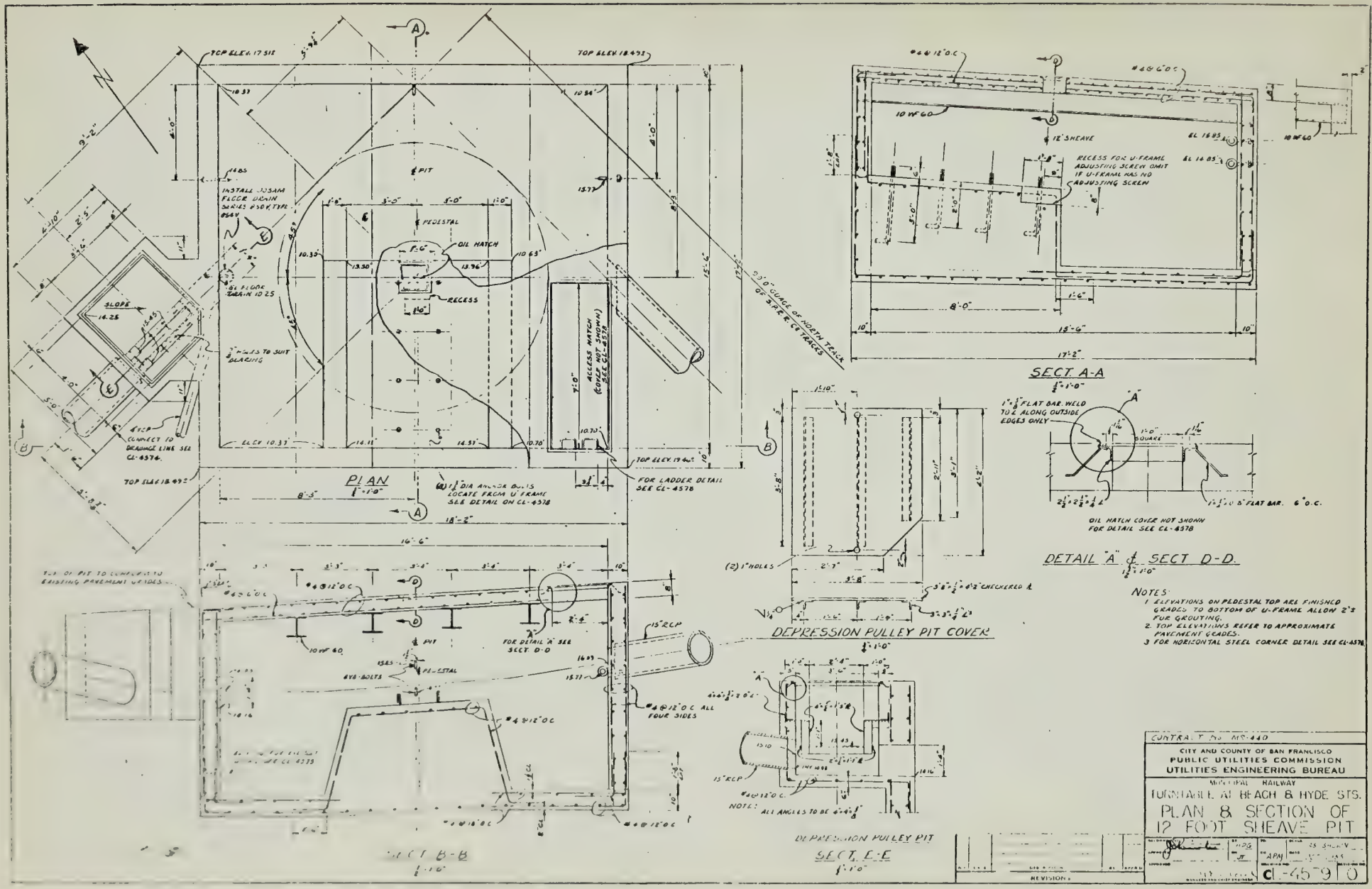

PLAN
SECT A-A
DETAIL "A" & SECT D-D
DEPRESSION PULLEY PIT COVER
SECT B-B
SECT E-E
DEPRESSION PULLEY PIT
NOTES:
1 ELEVATIONS ON PEDESTAL TOP ARE FINISHED GRADES TO BOTTOM OF U-FRAME ALLOW 2" FOR GROUTING.
2. TOP ELEVATIONS REFER TO APPROXIMATE PAVEMENT GRADES.
3 FOR HORIZONTAL STEEL CORNER DETAIL SEE CL-4576
CONTRACT No. MR-440
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY
TURNTABLE AT BEACH & HYDE STS.
PLAN & SECTION OF
12 FOOT SHEAVE PIT
CL-459 0

FIGURE 2.3.e

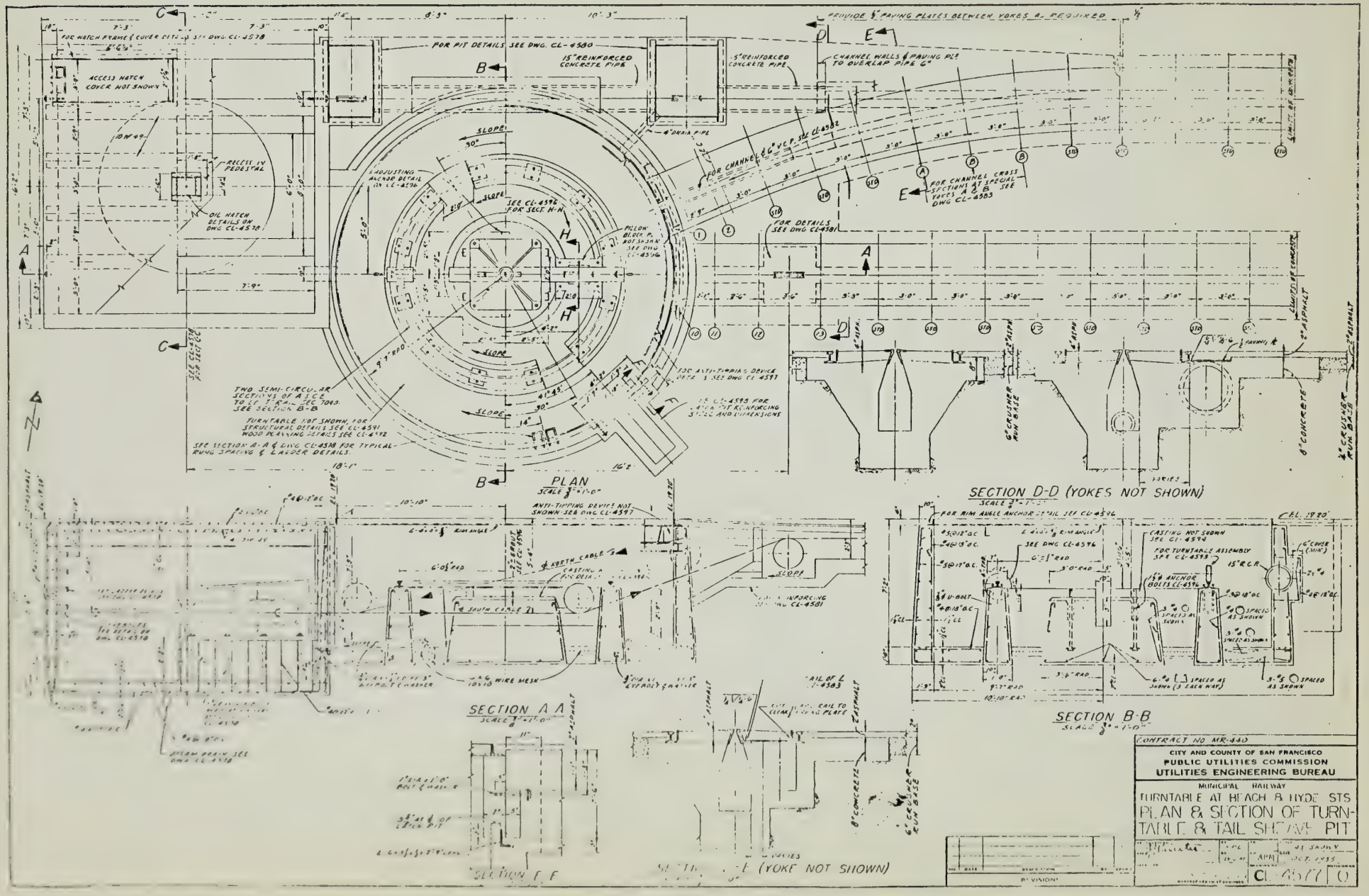

PLAN
SECTION D-D (YOKES NOT SHOWN)
SECTION A-A
SECTION B-B
SECTION E-E (YOKE NOT SHOWN)
SECTION F-F
CONTRACT NO. MR-540
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY
TURNTABLE AT BEACH & HYDE STS
PLAN & SECTION OF TURNTABLE & TAIL SHEAVE PIT
CL-4577

FIGURE 2.3.f

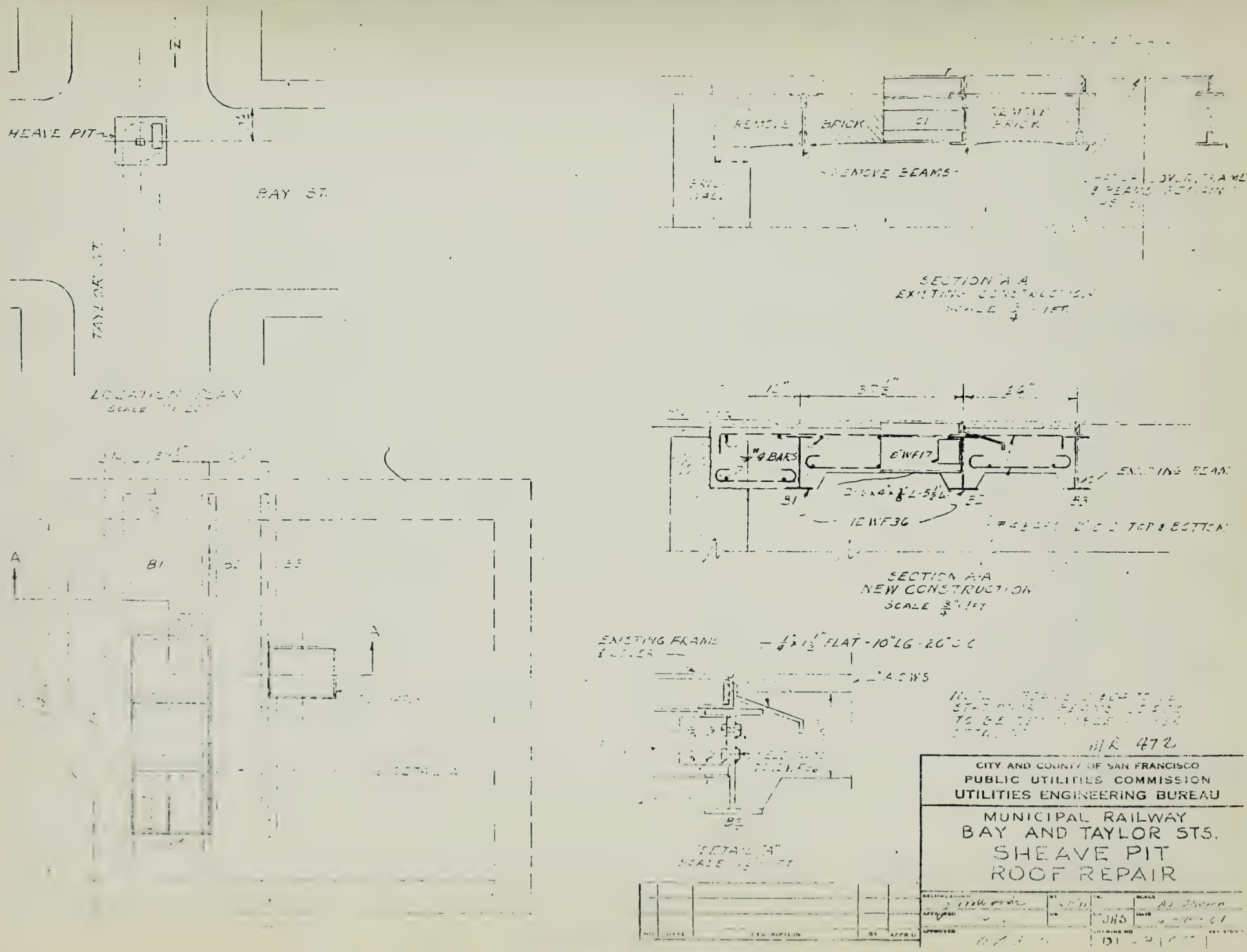

HEAVE PIT
BAY ST.
TAYLOR ST.
LOCATION PLAN
SCALE
REMOVE BRICK
REMOVE BRICK
REMOVE BEAMS
SECTION A-A
EXISTING CONSTRUCTION
SCALE 3/4" = 1 FT.
8 BARS
8"WF17
EXISTING BEAM
12"WF36
SECTION A-A
NEW CONSTRUCTION
SCALE 3/4" = 1 FT
EXISTING FRAME
- 4 x 1 1/2" FLAT - 10"LG - 20" C C
- 4 ANGLES
DETAIL "A"
SCALE
HR 472
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY
BAY AND TAYLOR STS.
SHEAVE PIT
ROOF REPAIR

FIGURE 2.3.g

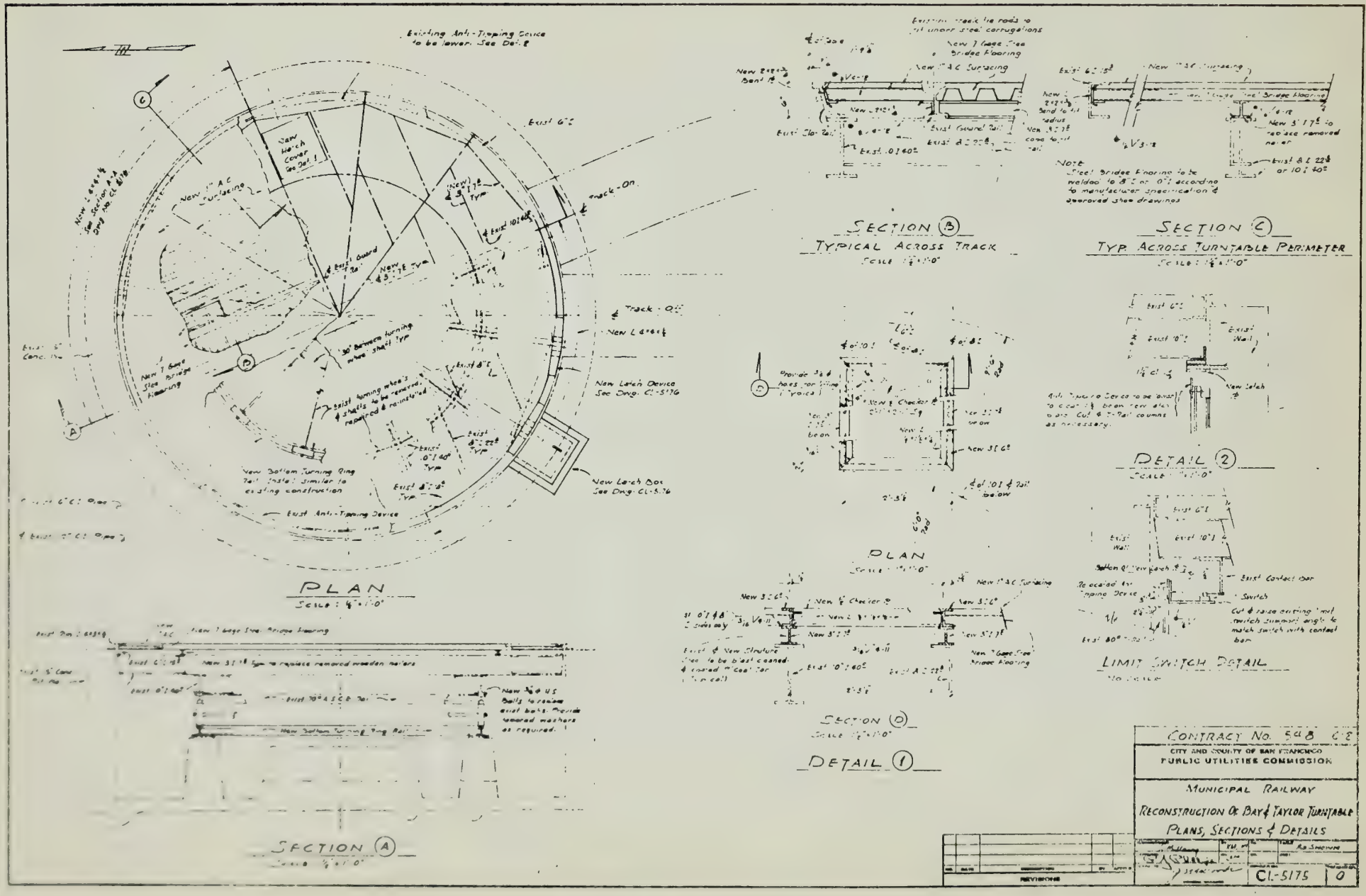

PLAN
SECTION (A)
SECTION (B)
TYPICAL ACROSS TRACK
SECTION (C)
TYP. ACROSS TURNTABLE PERIMETER
PLAN
SECTION (D)
DETAIL (1)
DETAIL (2)
LIMIT SWITCH DETAIL
CONTRACT No. 548 C.E.
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
MUNICIPAL RAILWAY
RECONSTRUCTION OF BAY & TAYLOR TURNTABLE
PLANS, SECTIONS & DETAILS
CI-5175
0

FIGURE 2.3.h

Section 2.4

PULLEYS

Pulleys in the system include two 12 ft, fourteen 10 ft, and one 8 ft sheaves; seven 42 in. horizontal sheaves; five 41 in., one 38 in., forty-three 30 in., thirty-eight 28 in., two 26 in., and forty-six 20 in. crowns; and about 635 9 in. carrying pulleys. For depression beam pulleys see Section 2.5, and for pull curve pulleys see Section 2.8.

2.4.1 Description

12 ft (see Figure 2.4.a)

Spider and rims medium strength carbon steel castings ASTM A27-52T Grade N-2. Diameter, 12 ft-6 in. Frame, cast iron U. Brass half-bearing, 5 in. diameter. Located in Hyde and Pacific, Hyde and Beach sheave pits.

10 ft (see Figures 2.4.b,c)

Fabricated or cast steel. Diameter, 10 ft-6 in. Width, either 6 in. or 10 in. at hub. Cast iron U frame. Brass half-bearing, 5 in. diameter. Located in barn sheave room (5) and California and Drumm, California and Mason (2), California and Hyde, California and Van Ness, Victorian Park, Bay and Taylor, Powell and Market, and Powell and Washington (2) sheave pits.

8 ft

Iron. Diameter about 8 ft-4 in. Cast iron pedestal, with fixed shaft. Brass sheave bearing. Located in barn sheave room.

42 in. Horizontal Sheave (see Figure 2.4.d)

Cast iron. Diameter, 42 in. Flanged brass bearing.

42 in. Crown (see Figure 2.4.e)

Cast steel ASTM A148-65. Class 120-95, 250-280 BHN. Diameter, 42 in. Babbitted half-bearing.

39 in. Crown (see Figure 2.4.f)

Cast steel ASTM A148-65, Class 120-95, 250-280 BHN. Diameter, 37-1/2 in. Babbitted half-bearing.

30 in Crown (see Figure 2.4.g)

Cast iron. Diameter, 30 in. Babbitted half-bearing.

28 in Crown (see Figure 2.4.h,i)

Cast iron. Diameter, 28 in. Babbitted half-bearing.

26 in. Crown (see Figure 2.4.j)

Cast steel ASTM A148-65. Class 120-95, 250-280 BHM. Diameter, 26 in. Babbitted half-bearing.

21 in. Crown (see Figure 2.4.k)

Cast steel ASTM A148-60. Class 80-50, 160 BHN. Diameter, 21 in. Antifriction or babbitted half-bearing.

9 in. Carrying -- regular (see Figure 2.4.1)

Cast steel ASTM A148-65. Class 80-50, 160-180 BHN. Diameter, 9-1/2 in. Width, 2-1/2 in. Brass bearing.

9 in. Carrying -- Pacific Avenue -- (see Figure 2.4.m)

Cast steel ASTM A148-65. Class 80-50, 160-180 BHN. Diameter, 9-1/8 in. Width, 3-3/4 in. Brass, babbitted, or antifriction bearing.

9 in. Carrying -- Experimental -- (see Figure 2.4.n)

Cast aluminum alloy #356 heat treated T51, 66 BHN, with polyurethane facing: Hardness shore D 74; tensile strength, 10,500 psi maximum; modulus, 3800 psi at 100 percent and 9000 psi at 300 percent; elongation, 230 percent maximum tear strength, 800 psi maximum; Bashore rebound, 45 percent; compression modulus, 2000 psi at five percent deflection and 3700 psi at 10 percent deflection; compression set, method B, one percent polyol or 35 percent MOCA measured after 22 hrs at 158° F. Diameter, 9-1/2 in. Antifriction bearing.

2.4.2 Inspection (see Attachment 2.4.A)

12 ft

Pulley wear criteria: Diameter to full cable groove, 12 ft; good 11 ft-11 in.; fair 11 ft-10 in.; poor, 11 ft-9 in.; destruction, 11 ft-7 in.

Inspection results:

- Barn

  Pulley -- 9 good, 7 fair; frames -- 8 good, 6 fair; bearings -- 22 good, 9 fair, 2 poor.

- California and Drumm

  Pulley -- good; frame -- fair, bearing -- poor (overheating).

- California and Mason (8-C-2)

  Pulley -- good; frame -- good; bearing -- good.

- California and Mason (9-C-7)

  Pulley -- good; frame -- good; bearing -- good.

- California and Hyde

  Pulley -- good; frame -- good; bearing -- good.

- California and Van Ness

  Pulley -- good; frame -- good; bearing -- good.

- Victorian Park

  Pulley -- fair; frame -- good; bearing -- poor (overheating).

- Bay and Taylor

  Pulley -- good; frame -- good; bearing -- fair (overheating).

- Powell and Market

  Pulley -- good; frame -- fair; bearing -- good.

- Powell and Washington

  Pulley -- poor; frame -- fair; bearing -- fair.

8 ft

Pulley wear criteria: Diameter to full cable groove, 8 ft; good, 7 ft-10 in.; fair, 7 ft-9 in.; poor, 7 ft-8 in.; destruction, 7 ft-6 in.

Inspection results: pulley -- fair, frame -- fair; bearing -- fair.

42 in. Horizontal Sheave

Pulley wear criteria: Diameter to full cable groove, 29-1/4 in.; good 38-1/4 in.; poor, 36 in.; destruction 35-1/2 in.

Inspection results (7 in system): 7 good.

42 in. Crown

Pulley wear criteria: Diameter to full cable groove, 39-1/4 in.; good, 38-3/4 in.; fair, 38-3/8 in.; poor, 38-1/8 in.; destruction, 37-5/8 in.

Inspection results (5 in system):
4 good, 1 fair.

39 in. Crown

Pulley wear criteria: Diameter to full cable groove, 35-5/16 in.; good, 34-3/4 in.; fair, 33 in.; poor, 32-3/4 in.; destruction 32-5/15 in.

Inspection results (1 in system):

Good.

30 in. Crown

Pulley wear criteria: Diameter to full cable groove, 28-1/2 in.; good, 27-3/4 in.; fair, 26 in.; poor, 24-1/8 in.; destruction, 23-5/8 in.

Inspection results (43 in system):

29 good, 14 fair.

28 in. Crown

Pulley wear criteria: Diameter to full cable groove, 26-3/4 in.; good, 25-3/4 in.; fair, 23-1/4 in.; poor, 21-1/4 in.; destruction, 20-1/2 in.

Inspection results (38 in system):

33 good, 4 fair, 1 poor.

26 in. Crown

Pulley wear criteria: Diameter to full cable groove, 23-in.; good, 22-1/4 in.; fair, 21 in.; poor 19-3/4 in.; destruction, 19-1/4 in.

Inspection results (2 in system):

1 good, 1 fair.

21-in. Crown

Pulley wear criteria: Diameter to full cable groove, 20 in.; good, 19 in.; fair, 17-3/4 in.; poor 16-1/2 in.; destruction, 16 in.

Inspection results (46 in system):
41 good, 4 poor, 1 fair.

9 in. Carrying -- Regular

Condition criteria: Pulley wear -- diameter to full cable groove, 8-1/2 in.; good, 8 in.; fair, 7-3/8 in.; poor, 6-3/4 in.; destruction, 6-1/2 in. Supports -- good, holds pulley at proper height; fair, corrosion or rot (wooden) evident; poor, broken or rotted and providing no support to pulley.

Inspection results (46 in system):
Pulleys -- 17 good, 13 fair, 16 poor (included stopped or slowed pulleys); supports -- 39 good, 5 fair, 2 poor.

9 in. Carrying -- Pacific Avenue

Condition criteria: Pulley wear -- diameter to full cable groove, 7-3/4 in.; good, 7-1/4 in.; fair, 6-5/8 in.; poor, 6 in.; destruction, 5-3/4 in. Supports -- same as 9 in. regular carrying pulley, above.

Inspection results (488 in system):

Pulleys -- 276 good, 134 fair, 78 poor (includes stopped or slowed pulleys); supports -- 312 good, 78 fair, 98 poor.

9 in. Carrying -- Experimental

Condition criteria: Pulley wear (polyurethane facing) -- diameter to full cable groove, 8-5/8 in.; good, 8-1/2 in.; fair, 8-1/4 in.; poor, 7-3/4 in.; destruction, 7-1/2 in. Supports -- same as 9 in. regular carrying pulley, above.

Inspection results (101 in system):

Pulleys -- 81 good, 10 fair, 10 poor (includes stopped or slowed pulleys); supports -- 74 good, 8 fair, 19 poor.

Of the 635 carrying pulleys inspected, 120 were not rotating and had flat spots due to cable abrasion, were rotating intermittently and had flat spots, had poor bearings, or were out of their supports, and at many designated stations the pulleys were missing.

2.4.3 Evaluation

Malfunctioning of the carrying pulleys is due primarily to inadequate maintenance. Failure to clean the channel results in the impaction of debris and pine tar residue around pulleys, and rotation is consequently slowed or stopped. Failure to lubricate pulleys results in worn bearings and shafts. The practice at the barn of pounding the shaft of the aluminum

pulley into the bearing with a sledge hammer (instead of pressing it in) damages the bearing by driving the balls into the race. Following is the record of the last maintenance performed on the 120 malfunctioning carrying pulleys previous to the Chin & Hensolt inspection (maintenance data was collected from entries on cards kept in the cable machinery supervisor's office):

Chart 1

MALFUNCTIONING PULLEYS:
LAST SERVICE BEFORE C & H INSPECTION

Hatch	Chin & Hensolt Inspection		Last Service		Days Since Last Service
	Date	Malfunction	Date	Service Performed	
HY2026	8/7/78	Bad Bearings	3/31/78	Changed Pulley	129
HY2060	8/7/78	Bad Bearings	6/20/78	Changed Pulley	48
HY2136	8/7/78	Pulley Off Frame	10/14/77	Greased	297
HY2140	8/7/78	Pulley Stopped	10/14/77	Greased	297
HY2658	8/7/78	Pulley Stopped	10/14/77	None Recorded	297
HY2741	8/8/78	Pulley Stopped	10/3/77	Changed Bearings	309
HY2641	8/8/78	Pulley Stopped	10/3/77	None Recorded	309
HY2544	8/8/78	Pulley out of Frame	10/3/77	No Card	309
HY1623	8/9/78	Pulley Stopped	11/14/77	Changed Pulley	268
HY1525	8/9/78	Pulley Stopped	11/14/77	No Card	268
HY1435	8/9/78	Rope Alongside Pulley	6/30/78	Changed Pulley	40
HY1415	8/9/78	Rope Cutting Shaft	6/30/78	Changed Pulley	40
HY1474	8/9/78	Pulley Down - Rope Alongside	6/30/78	No Card	40
HY1136	8/28/78	Bearings Squeeking	6/31/78	No Card	58
HY1354	8/28/78	Pulley Stopped	6/31/78	No Card	59
HY1221	8/28/78	Pulley Rotation Slow	4/13/78	Changed Pulley	127
HY1135	8/28/78	Bearings Squeeking	2/24/78	Changed Pulley & Frame	185
CO910	8/10/78	Pulley Stopped	10/24/77	Greased	583
CO913	8/10/78	Pulley Rotation Slow	5/10/77	Greased	82
CO986	8/10/78	Rope Alongside Pulley	1/20/78	Changed Pulley	264
CO955	8/11/78	Pulley Stopped; Cut by Rope	1/20/78	Greased	265
JA1025	8/4/78	Pulley Turning Slowly	7/16/78	Greased	19
JA1032	8/4/78	Pulley Turning Slowly	7/16/78	Changed Pulley	19
JA1042	8/4/78	Rope Alongside Pulley	8/1/78	Changed Pulley	3
JA1281	8/4/78	Bad Bearings	8/1/78	No Card	3
PO651	8/14/78	Pulley Stopped	8/1/78	Changed Pulley	13
PO371	8/14/78	Bearings Dry	4/26/78	Changed Pulley	110
PO442	8/14/78	Rope Alongside Pulley	2/13/78	Changed Pulley	182
PO562	8/14/78	Bearings Dry; Pulley Squeeking	11/17/77	Greased	270
PO640	8/15/78	Pulley Stopped	5/3/78	Greased	104
PO716	8/15/78	Rope Alongside Pulley	5/10/77	Greased	112

Chart 1 (cont.)

Hatch	Chin & Hensolt Inspection		Last Service		Days Since Last Service
	Date	Malfunction	Date	Service Performed	
PO822	8/15/78	Pulley Stopped	10/11/77	Changed Pulley	308
PO1032	8/15/78	Pulley Stopped	6/11/78	Changed Pulley	65
PO1042	8/15/78	Pulley Stopped	2/2/78	Changed Pulley	194
MA1370	8/10/78	Rope Alongside Pulley	10/20/77	Greased	294
MA1500	8/10/78	Rope Alongside Pulley	10/18/77	Changed Bearings	292
MA1680	8/10/78	Pulley Stopped	4/17/78	Changed Pulley	116
MA1922	8/10/78	Pulley Stopped	10/5/77	Changed Pulley	308
MA1948	8/10/78	Pulley Stopped	5/23/78	Tighten	69
MA1739	8/11/78	Bearings Dry; Squeeking	5/11/77	Greased	92
MA1679	8/11/78	Pulley Down; Cut by Rope	10/18/77	Changed Pulley	297
MA1587	8/11/78	Pulley Stopped	5/12/77	Greased	91
MA1257	8/11/78	Pulley Stopped; Rope Alongside	8/18/77	Greased	354
TA2310	8/10/78	Pulley Stopped; Cut by Rope	2/3/78	Changed Pulley	188
TA2339	8/10/78	Pulley Stopped; Cut by Rope	1/18/78	Greased	204
TA2309	8/10/78	Pulley Down	5/11/77	Greased	91
CA879	8/15/78	Pulley Stopped	7/20/78	Changed Pulley	26
CA779	8/15/78	Pulley Stuck	7/20/78	No Card	26
CA729	8/15/78	Bearings Dry	8/8/78	Changed Pulley	7
CA633	8/15/78	Pulley Down	8/3/78	Changed Pulley	12
CA523	3/15/78	Pulley Stopped	11/3/77	Greased	132
CA499	3/15/78	Pulley Stopped	11/27/77	Greased	108
CA477	3/15/78	Pulley Stopped	11/3/77	Changed Pulley	132
CA423	3/15/78	Pulley Stopped; Bad Bearings	12/1/77	Changed Pulley Frame	104
CA401	3/15/78	Pulley Stopped	1/23/78	Cleaned	51
CA349	3/15/78	Pulley Stopped	3/2/78	Changed Pulley	13
CA267	3/15/78	Pulley Stopped	3/2/78	No Card	13
CA197	3/15/78	Rope Alongside Pulley	11/2/77	Cleaned & Greased Frame	13
CA171	3/15/78	Pulley Stopped	4/4/77	Greased	345
CA161	3/15/78	Pulley Stopped	11/2/77	Cleaned & Greased	133
CA96	3/15/78	Pulley Stopped	11/2/77	No Card	133
CA39	3/15/78	Pulley Rotation Slow	11/2/77	Changed Frame 8"	133
CA11	3/15/78	Pulley Stopped	9/30/77	Changed P.A.	166
CA05	8/16/78	Pulley Stopped	6/6/77	Cleaned & Greased	71
CA24	8/16/78	Rope Alongside Pulley	7/24/78	Changed Pulley & Frame	24
CA34	8/16/78	Pulley Door	8/4 78	Changed Pulley	12
CA40	8/16/78	Rope Cut through Framing	8/4/78	Changed Pulley & Frame	12
CA44	8/16/78	Rope Alongside Pulley	8/4/78	Changed Pulley & Frame	12
CA50	8/16/78	Bearing Missing	11/2/77	Cleaned & Greased	287
CA60	8/16/78	Pulley Stopped	11/2/77	Cleaned & Greased	287
CA70	8/16/78	Pulley Stopped	3/13/78	Changed Pulley	156
CA112	8/16/78	Pulley Stopped	8/12/78	Changed Pulley	4
CA152	8/16/78	Pulley Stopped	11/2/77	Cleaned & Greased	287
CA210	8/16/78	Rope Alongside Pulley	8/8/78	Changed Pulley & Frame	8
CA226	8/16/78	Pulley Rotation Slow	3/13/78	Changed Pulley & Frame	156
CA250	8/16/78	Flat Spot on Pulley	3/13/78	Changed Pulley	156
CA260	8/16/78	Pulley Stopped	6/1/78	Changed Pulley	76
CA290	8/16/78	Pulley Down	11/2/77	Cleaned & Greased	287
CA310	8/16/78	Pulley Stopped	11/2/77	Cleaned & Greased	287
CA322	8/16/78	Pulley Rotation Slow	4/7/78	Changed Pulley	131
CA354	8/16/78	Pulley Rotation Slow	11/2/77	Cleaned & Greased	287

Chart 1 (cont.)

hatch	Chin & Hensolt Inspection		Last Service		Days Since Last Service
	Date	Malfunction	Date	Service Performed	
CA360	8/16/78	Pulley Rotation Slow	11/2/77	Cleaned & Greased	287
CA366	8/16/78	Pulley Stopped	11/2/77	Cleaned & Greased	287
CA488	8/16/78	Pulley Stopped	11/2/77	No Card	287
CA566	8/16/78	Pulley Rotation Slow	3/14/78	Changed Pulley & Frame	155
CA590	8/16/78	Facing Gone	7/21/78	Changed Pulley	26
CA650	8/16/78	Pulley Stopped	1/24/78	Cleaned	204
CA780	8/16/78	Worn Facing	1/24/78	No Card	204
CA832	8/16/78	Pulley Stopped	3/12/78	Changed Pulley	155
CA966	8/16/78	Pulley Down	3/11/77	Changed Pulley	154
CA982	8/16/78	Pulley Down	3/11/77	No Prev. Record	154
CA1016	8/28/78	Pulley Out of Frame	8/8/78	Changed Pulley	8
CA1046	8/28/78	Pulley Stopped	5/2/77	Cleaned & Greased	118
CA1076	8/28/78	Pulley Rotation Slow	5/9/77	Cleaned	111
CA1080	8/28/78	Rope Alongside Pulley	7/29/78	Changed Pulley	30
CA1088	8/28/78	Pulley Rotation Slow	5/5/77	Changed Pulley	115
CA1176	8/28/78	Pulley Rotation	5/12/77	Cleaned	108
CA1188	8/28/78	Pulley Stopped	5/12/77	Cleaned	108
CA1274	8/28/78	Pulley Stopped	11/16/77	Changed Bearings	273
CA1230	8/28/78	Pulley Stopped	10/20/77	Cleaned & Greased	312
CA1382	8/28/78	Pulley Stopped	10/19/77	Greased	313
CA1480	8/28/78	Pulley Stopped	12/1/77	Changed Pulley	270
CA1514	8/28/78	Pulley Out of Frame	12/13/77	Changed Pulley	282
CA1536	9/1/78	Pulley Stopped	6/13/77	Cleaned	78
CA1546	9/1/78	Pulley Stopped	5/2/77	Greased	152
CA1431	9/1/78	Pulley Stopped	10/7/77	Changed Pulley	329
CA1321	9/1/78	Pulley Out of Frame	8/2/78	Changed Pulley & Frame	28
CA1243	9/1/78	Pulley Stopped	10/3/77	Changed Pulley	332
CA1199	9/1/78	Pulley Down; Cut by rope	10/3/77	No Previous Record	337
CA1183	9/1/78	Pulley Down; Cut by Rope	5/5/78	Changed Pulley	118
CA1177	9/1/78	Pulley Flat Spot Noisy	8/8/78	Greased	22
CA1163	9/1/78	Pulley Flat Spot Noisy	8/8/78	No Previous Record	22
CA1151	9/12/78	Facing Worn Through	3/29/78	Changed Pulley	166
CA1095	9/12/78	Bearing Dry	5/18/77	Changed Pulley	116
CA1075	9/12/78	Pulley Out of Support	4/26/78	Changed Pulley	138
CA1061	9/12/78	Pulley Stopped	10/24/77	Changed Pulley	321
CA1021	9/12/78	Extra Pulley on Bottom	4/13/77	Changed Bearings	151
CA1003	9/12/78	Bearings cut by Rope	4/19/78	Changed Pulley	145
CA949	9/12/78	Support Down	8/28/78	Changed Pulley	14
CA939	9/12/78	Extra Pulley on Bottom	5/23/78	Changed Pulley	112

Malfunctioning pulleys increase the tension force required to move the cable, with consequent energy loss. Assuming that the approximately 900 carrying, crown, and depression-beam pulleys only provide vertical support for the rope -- and without consideration of the compounding effect of vertical and horizontal bends in the cable -- it would require about 22,000 lb of tension force to move the cable if none of the pulleys was functioning. When all the pulleys are functioning, the required tension force, depending on pulley type and bearing type, is as follows:

Chart 2

CARRYING PULLEYS:
EFFECT ON TENSION FORCE
REQUIRED TO MOVE CABLE

Pulley Type	Tension Force (in lb)	
	Bushed Bearings	Antifriction Bearings
9" cast iron	1950	975
9" aluminum	1750	875

If 15 percent of the pulleys providing vertical support for the cable are not functioning, the tension force required to move the cable increases 200 to 400 percent (again, without considering the effect of vertical and horizontal bends):

Chart 3

MALFUNCTIONING PULLEYS:
EFFECT ON TENSION FORCE

(with 15% of pulleys not providing vertical support)

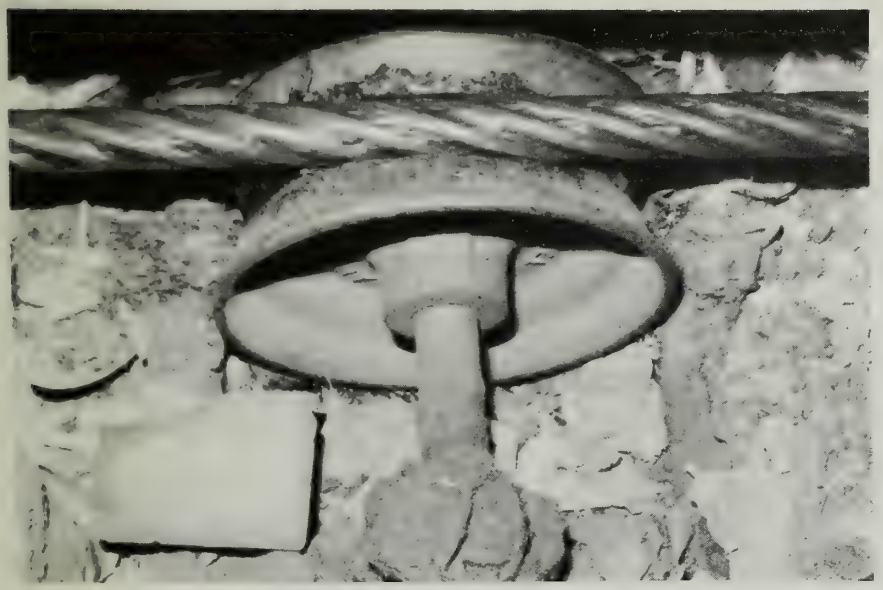
Pulley Type	Tension Force (in lb)	
	Bushed Bearings	Antifriction Bearings
9" cast iron	4960	4130
9" aluminum	4790	4045

Vertical and horizontal bends in the cable can increase geometrically the effect of malfunctioning pulleys on tension force.

It is clear from the above calculations that inadequate pulley maintenance results in unnecessary tension force and energy loss. Although the substitution of 9 in. aluminum pulleys for the regular and Pacific Av pulleys would not reduce tension force significantly, their lighter weight -- 10 lb, as compared to 30 lb -- facilitates handling for maintenance. However, the polyurethane facing wears through in about 60 days and without it the cable cuts through the aluminum hub in about three hrs. Sometimes the facing comes loose, and the pulleys often arrive from the manufacturer with aluminum shavings in the antifriction bearings.

Illustrations

Cable cutting shaft of stopped carrying pulley.

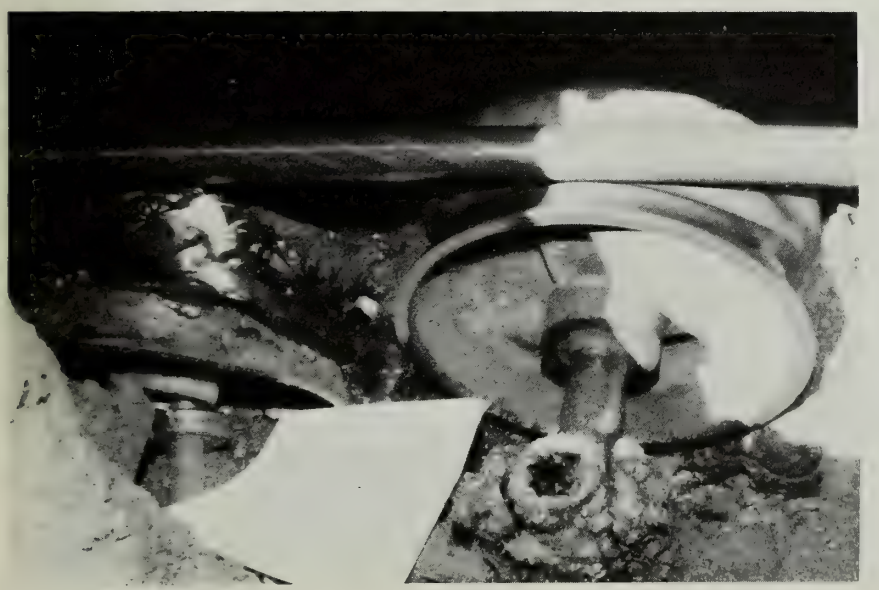


Cable cutting into groove of stopped P.A. carrying pulley.

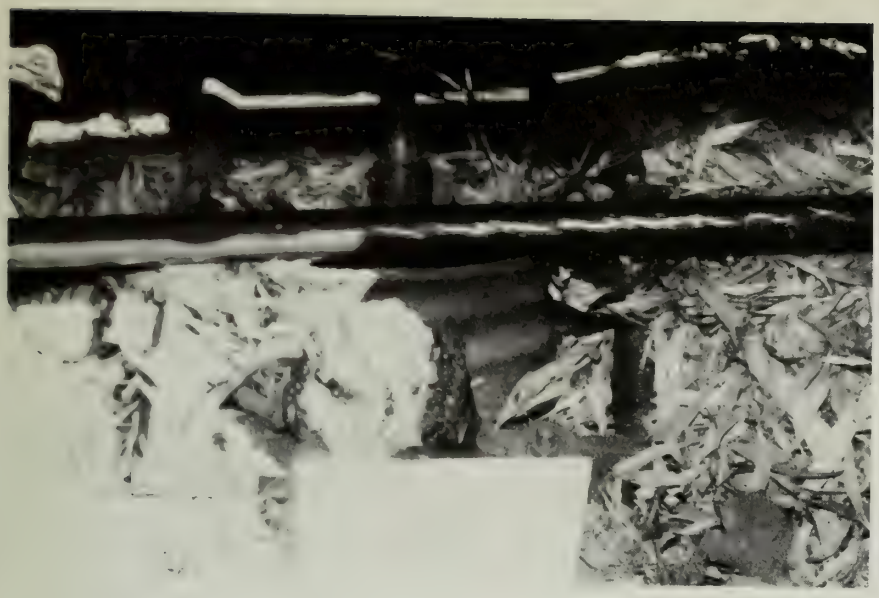
Stopped carrying pulley, with rim chipped by cable.

Carrying pulley stopped by accumulation of debris.

Carrying pulley out of frame and buried in debris.

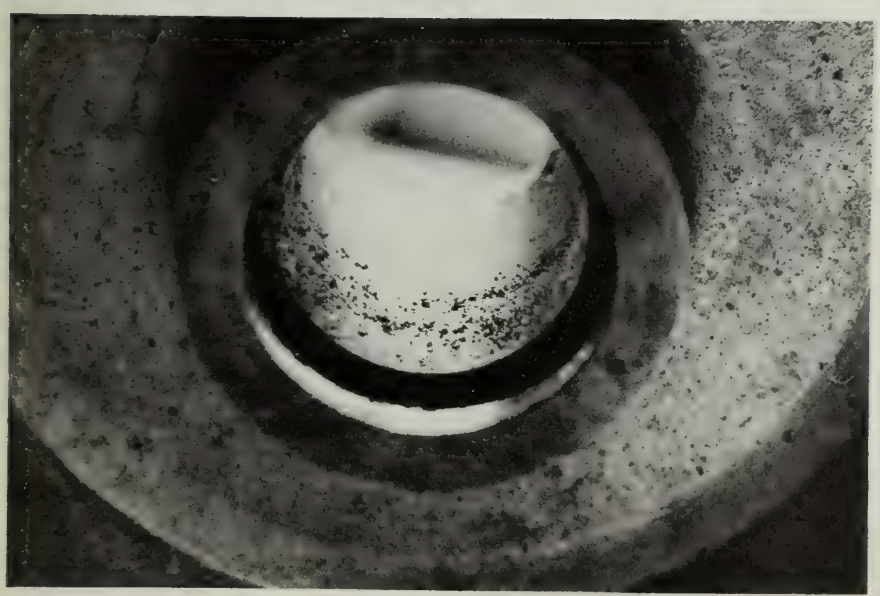


Carrying pulley (left) out of frame and dragged by cable.



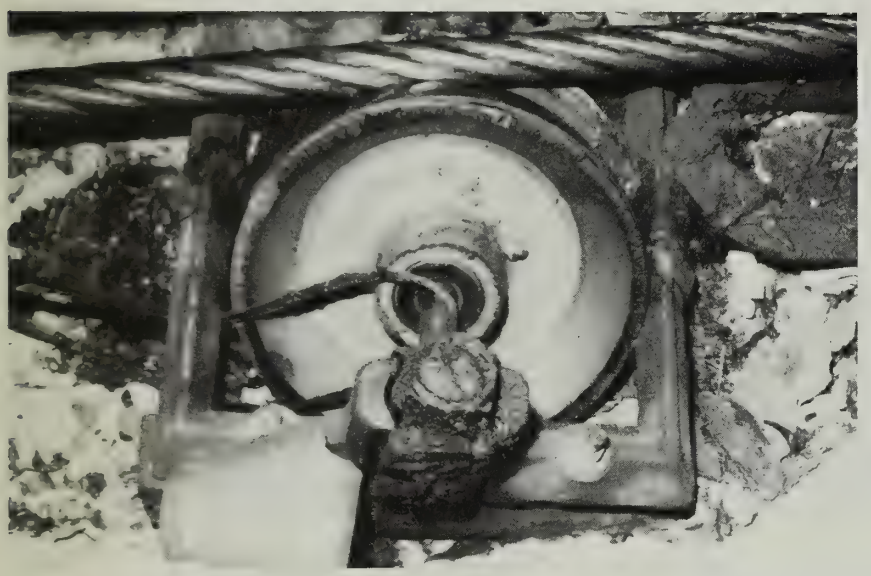
Carrying pulley buried in debris, with rope cutting shaft.

Piece of polyurethane facing torn away from groove of aluminum carrying pulley.



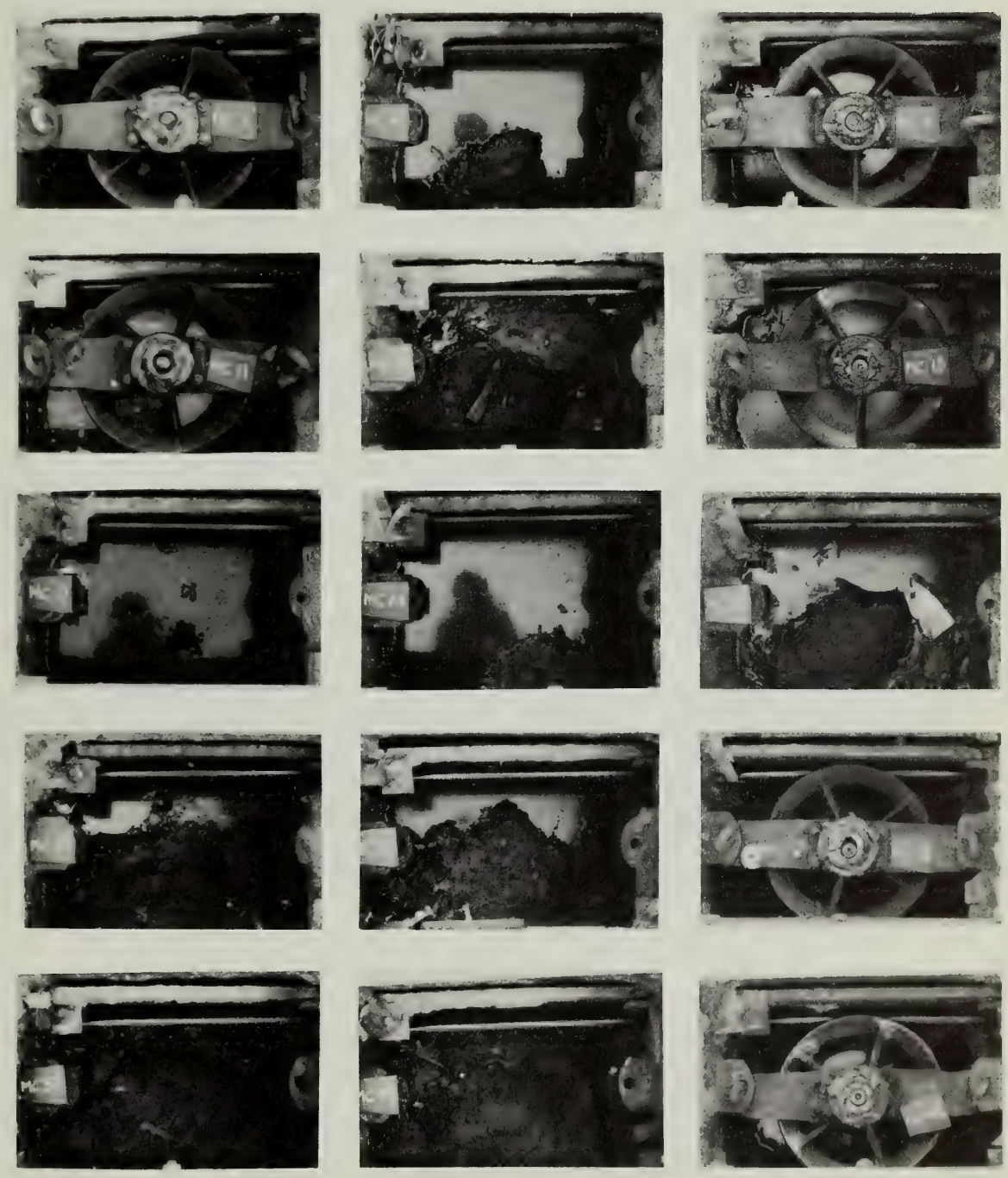
Aluminum shavings in bore of aluminum pulley.

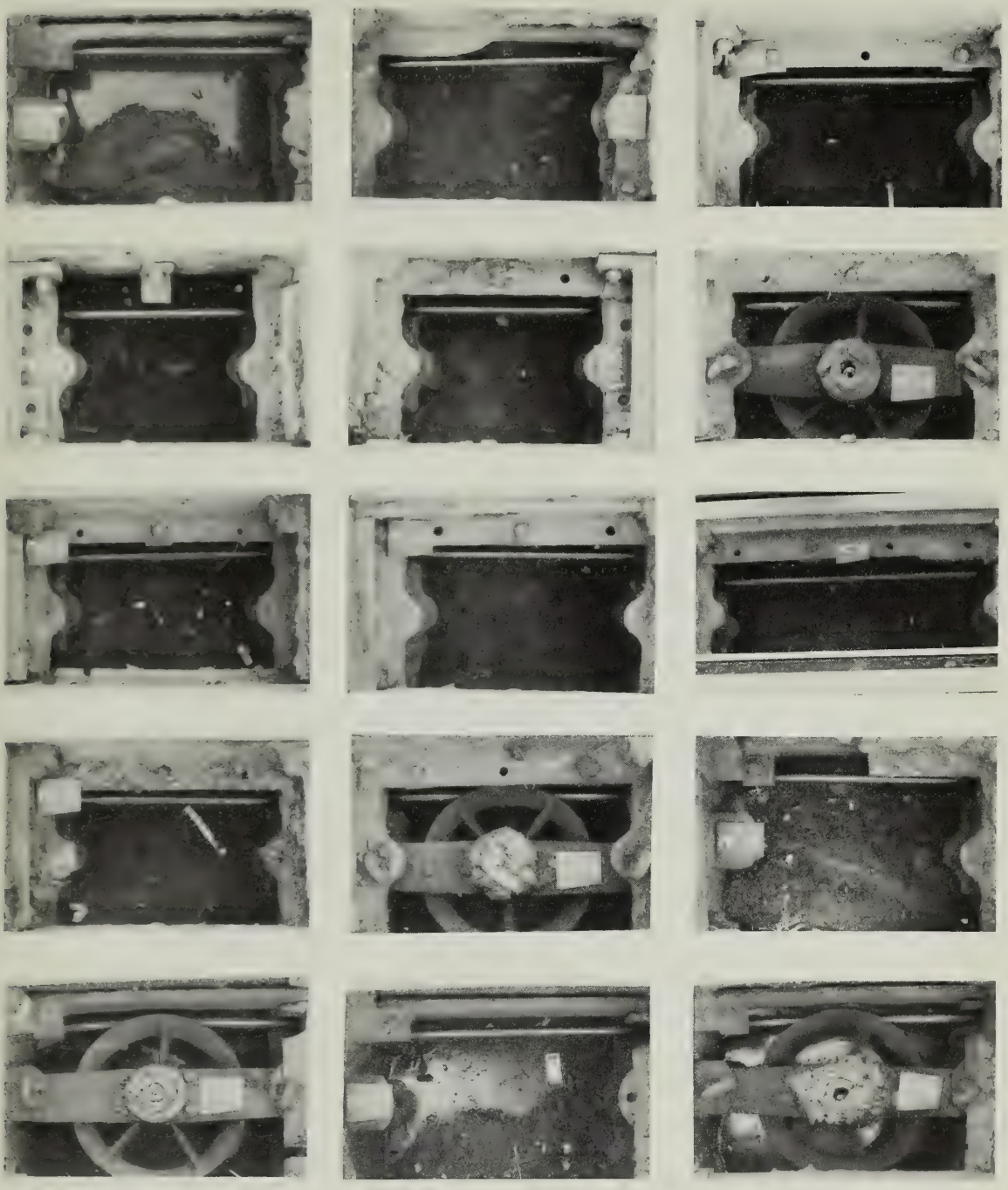
Aluminum carrying pulley off its frame, with cable beginning to cut its shaft.



Aluminum carrying pulley torn out of its bearing, with a piece of polyurethane facing caught on its shaft.

Thirty of the forty-five pulleys at the Columbus to Mason pull curve are malfunctioning, stopped, or missing from their stations.





Figures

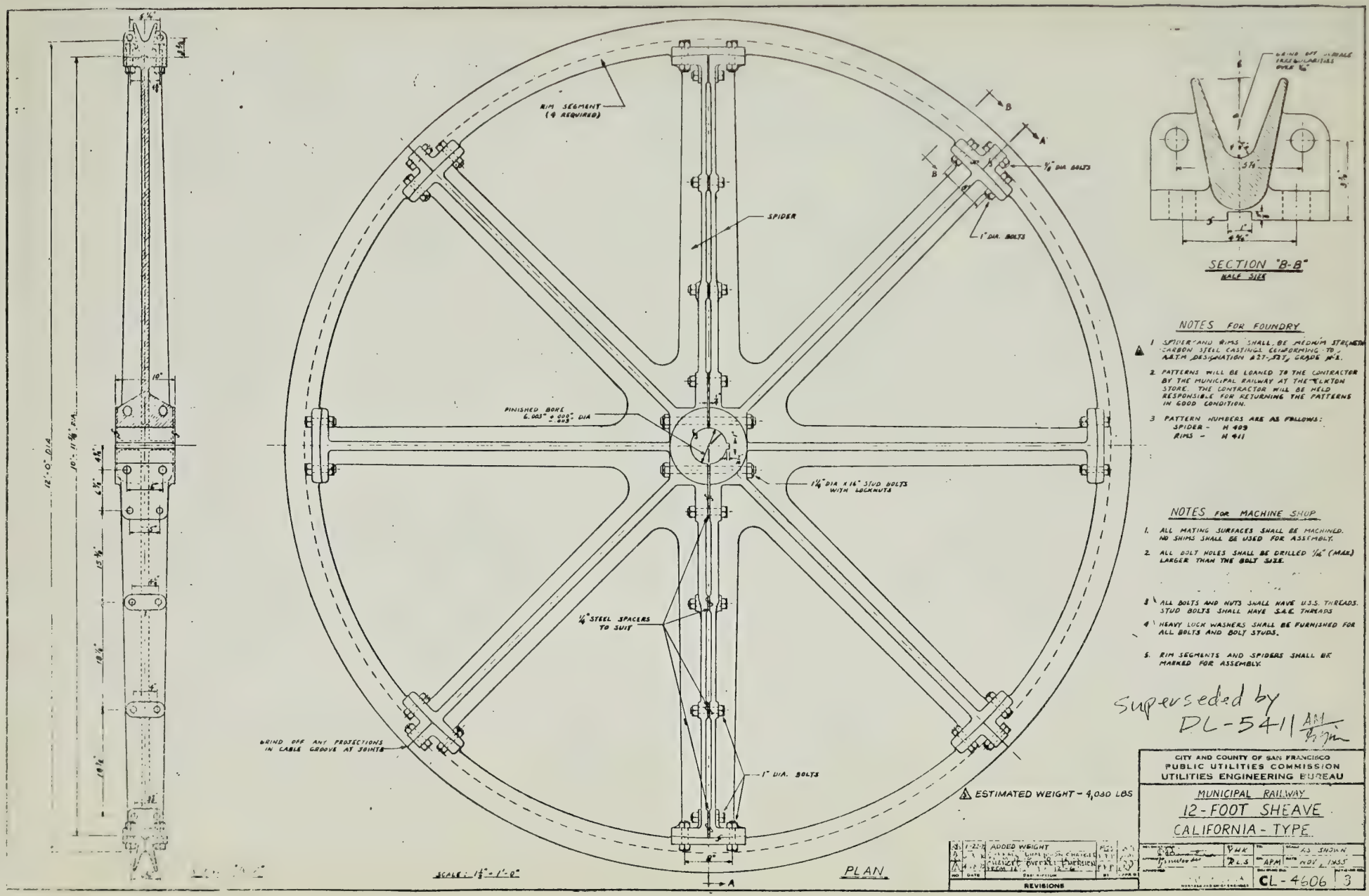

RIM SEGMENT (4 REQUIRED)
SPIDER
FINISHED BORE 6.003" + .005" - .003" DIA
1¼" DIA x 16" STUD BOLTS WITH LOCKNUTS
¼" STEEL SPACERS TO SUIT
GRIND OFF ANY PROJECTIONS IN CABLE GROOVE AT JOINTS
1" DIA. BOLTS
⅞" DIA BOLTS
1" DIA. BOLTS
12'-0" DIA
10'-11⅛" P.D.
SCALE: 1½"=1'-0"
PLAN
SECTION "B-B"
HALF SIZE
NOTES FOR FOUNDRY
1 SPIDER AND RIMS SHALL BE MEDIUM STRENGTH CARBON STEEL CASTINGS CONFORMING TO A.S.T.M. DESIGNATION A27-52T, GRADE 70-40.
2. PATTERNS WILL BE LOANED TO THE CONTRACTOR BY THE MUNICIPAL RAILWAY AT THE ELKTON STORE. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR RETURNING THE PATTERNS IN GOOD CONDITION.
3 PATTERN NUMBERS ARE AS FOLLOWS:
SPIDER - H 409
RIMS - H 411
NOTES FOR MACHINE SHOP
1. ALL MATING SURFACES SHALL BE MACHINED. NO SHIMS SHALL BE USED FOR ASSEMBLY.
2. ALL BOLT HOLES SHALL BE DRILLED 1/16" (MAX.) LARGER THAN THE BOLT SIZE.
3 ALL BOLTS AND NUTS SHALL HAVE U.S.S. THREADS. STUD BOLTS SHALL HAVE S.A.E. THREADS
4 HEAVY LOCK WASHERS SHALL BE FURNISHED FOR ALL BOLTS AND BOLT STUDS.
5. RIM SEGMENTS AND SPIDERS SHALL BE MARKED FOR ASSEMBLY.
Superseded by DL-5411 AM
ESTIMATED WEIGHT - 4,030 LBS
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY
12-FOOT SHEAVE
CALIFORNIA-TYPE
REVISIONS
ADDED WEIGHT
AS SHOWN
NOV 1, 1955
CL-4606 3

FIGURE 2.4.a

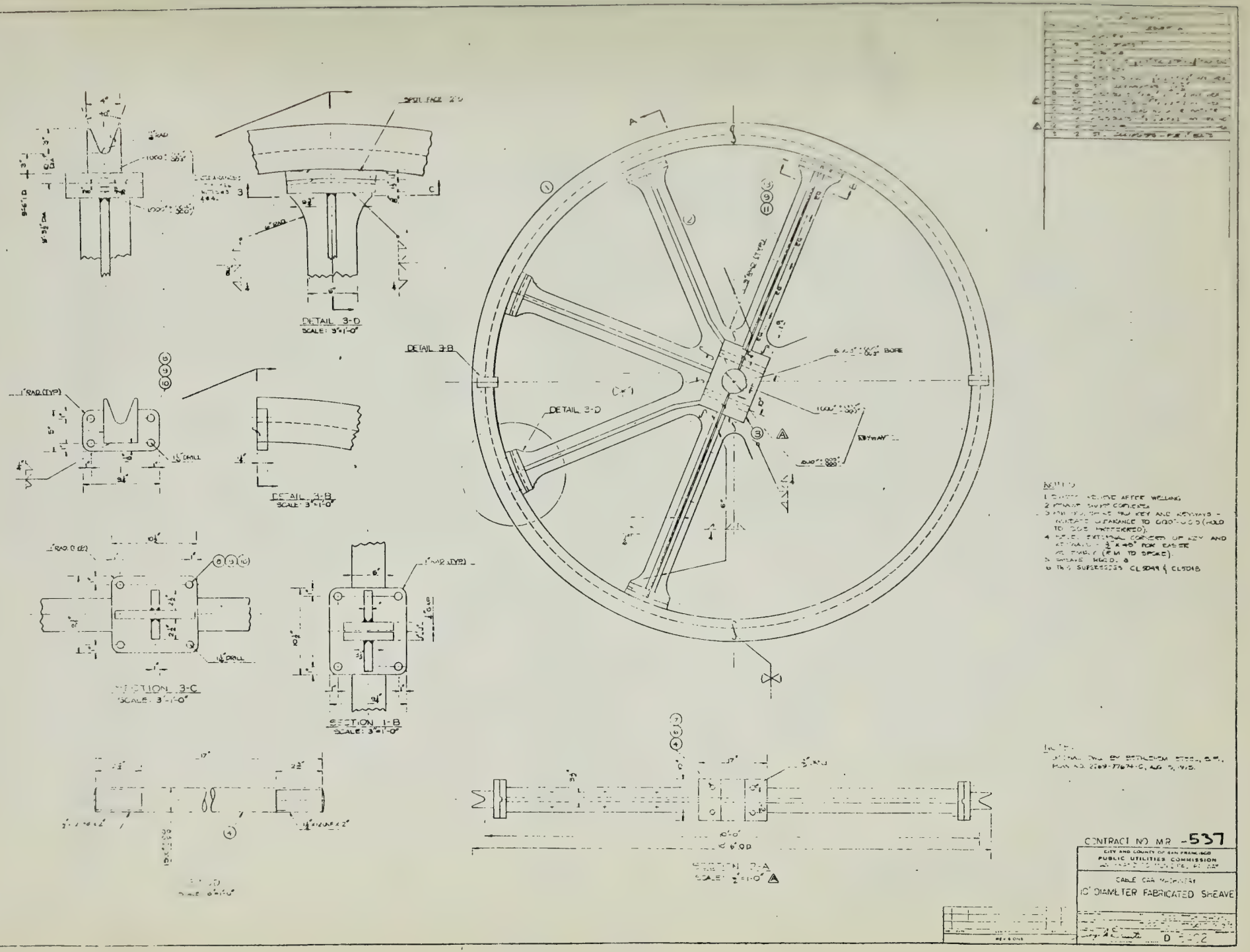

DETAIL 3-D
SCALE: 3"=1'-0"
DETAIL 3-B
SCALE: 3"=1'-0"
DETAIL 3-B
DETAIL 3-D
SECTION 3-C
SCALE: 3"=1'-0"
SECTION 1-B
SCALE: 3"=1'-0"
SECTION 2-A
SCALE: 1"=1'-0"
CONTRACT NO MR -537
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
CABLE CAR MACHINERY
10' DIAMETER FABRICATED SHEAVE

FIGURE 2.4.b

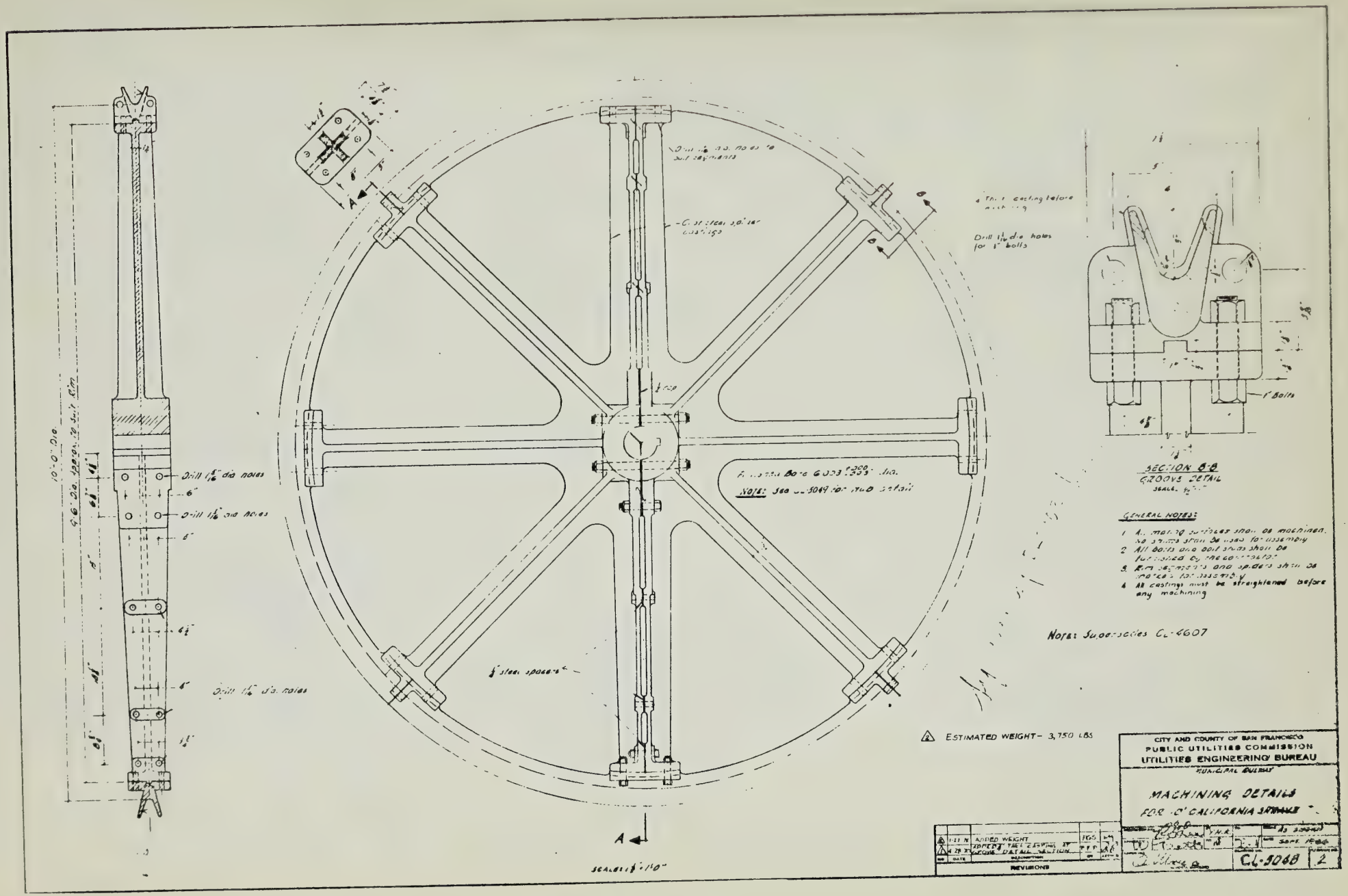

Drill 1½" dia holes
6"
Drill 1½" dia holes
8"
6½"
8"
Drill 1½" dia holes
1½"
A
A
SCALE: ½"=1'-0"
Drill 1½" dia holes for 1" bolts
1" Bolts
SECTION B-B
GROOVE DETAIL
SCALE: ½"
GENERAL NOTES:
1. All machined surfaces shall be machined.
2. All bolts and bolt studs shall be furnished by the contractor.
3. All segments and spokes shall be marked for assembly.
4. All castings must be straightened before any machining
Note: Supersedes CL-4607
ESTIMATED WEIGHT- 3,750 LBS
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL BUREAU
MACHINING DETAILS
FOR 'C' CALIFORNIA SPRINGS
REVISIONS
CL-3068
2

FIGURE 2.4.c

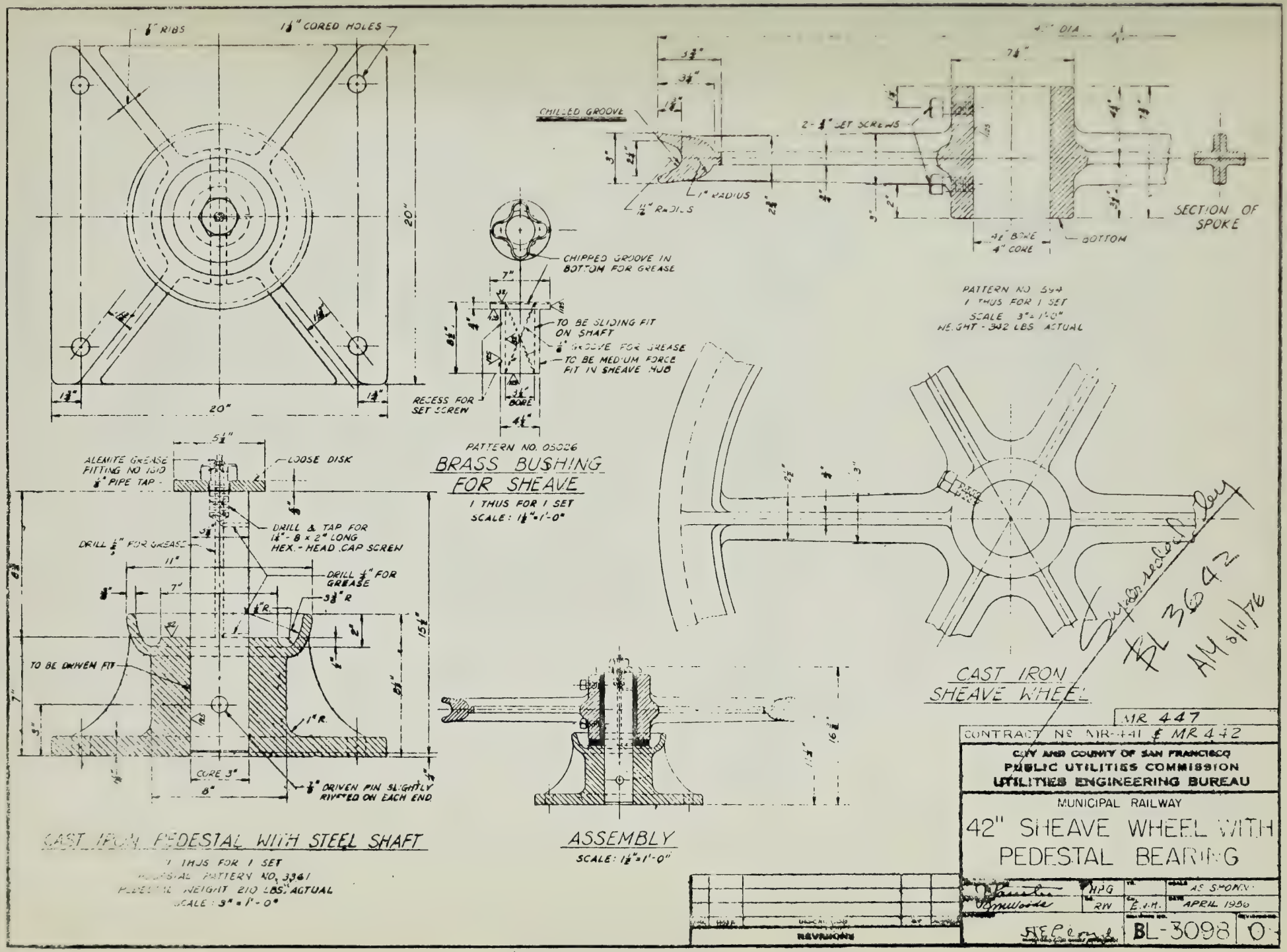
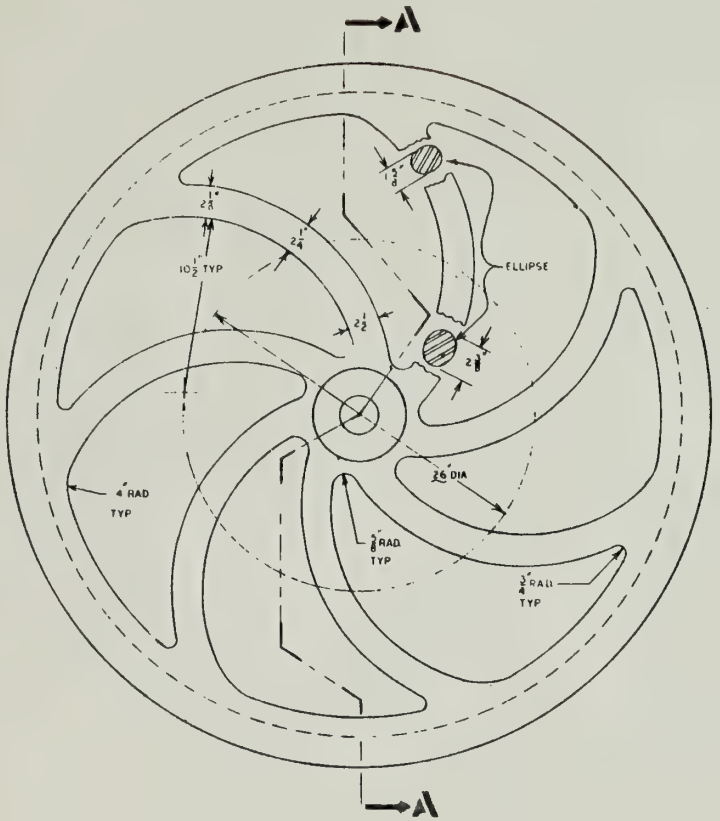
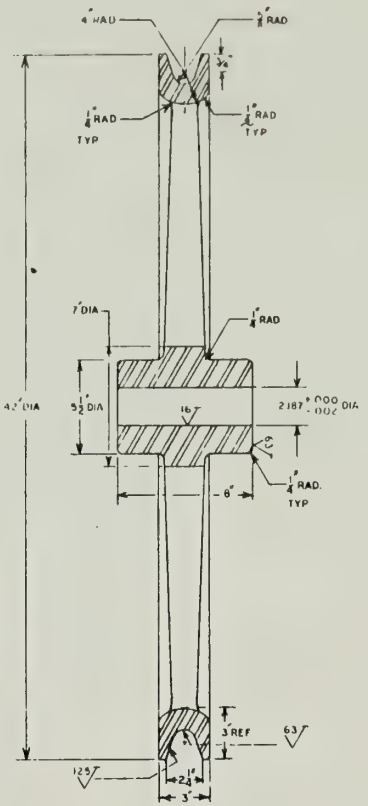

8" RIBS
1 1/8" CORED HOLES
20"
20"
1 1/2"
1 1/2"
CHILLED GROOVE
3 1/2"
3 1/4"
1 1/4"
2 - 1" SET SCREWS
1" RADIUS
1 1/2" RADIUS
3"
4 1/2"
4"
2"
3"
7 1/2"
4" DIA
4 1/2" BORE
4" CORE
BOTTOM
SECTION OF SPOKE
PATTERN NO 544
1 THIS FOR 1 SET
SCALE 3" = 1'-0"
WEIGHT - 302 LBS ACTUAL
CHIPPED GROOVE IN BOTTOM FOR GREASE
7"
4"
6 1/2"
TO BE SLIDING FIT ON SHAFT
1/8" GROOVE FOR GREASE
TO BE MEDIUM FORCE FIT IN SHEAVE HUB
RECESS FOR SET SCREW
3 1/2" BORE
4 1/2"
PATTERN NO. 05026
BRASS BUSHING FOR SHEAVE
1 THIS FOR 1 SET
SCALE: 1 1/2" = 1'-0"
5 1/2"
ALEMITE GREASE FITTING NO 1610
1/8" PIPE TAP
LOOSE DISK
DRILL & TAP FOR 1/2" - 8 x 2" LONG HEX. - HEAD CAP SCREW
DRILL 1/8" FOR GREASE
11"
DRILL 1/4" FOR GREASE
8"
7"
3 3/8" R
1" R
2"
1"
TO BE DRIVEN FIT
15 1/2"
8 1/2"
7"
3"
1" R.
CORE 3"
8"
1/8" DRIVEN PIN SLIGHTLY RIVETED ON EACH END
CAST IRON PEDESTAL WITH STEEL SHAFT
1 THIS FOR 1 SET
MUNICIPAL PATTERN NO. 3961
PEDESTAL WEIGHT 210 LBS. ACTUAL
SCALE: 3" = 1'-0"
16 1/2"
1 1/2"
ASSEMBLY
SCALE: 1 1/2" = 1'-0"
CAST IRON SHEAVE WHEEL
MR 447
CONTRACT Nº MR-441 & MR 442
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY
42" SHEAVE WHEEL WITH PEDESTAL BEARING
HPG
RW
E.H.M.
AS SHOWN
APRIL 1986
BL-3098
REVISIONS

FIGURE 2.4.d





SECTION A-A

NOTES:

1. THIS DRAWING IS MADE ACCORDING TO PATTERN No. H 213
2. MATERIAL TO BE OF CAST STEEL
   ASTM-A148 65
   CLASS 120-95
   250-280 BHN
3. APPROXIMATE WEIGHT - 985 lbs
4. BREAK SHARPS & BURRS
5. TOLERANCE :
   ± 1/32" MACHINING
   ± 1/16" CASTING

CONTRACT NO. MR.

CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
SAN FRANCISCO MUNICIPAL RAILWAY

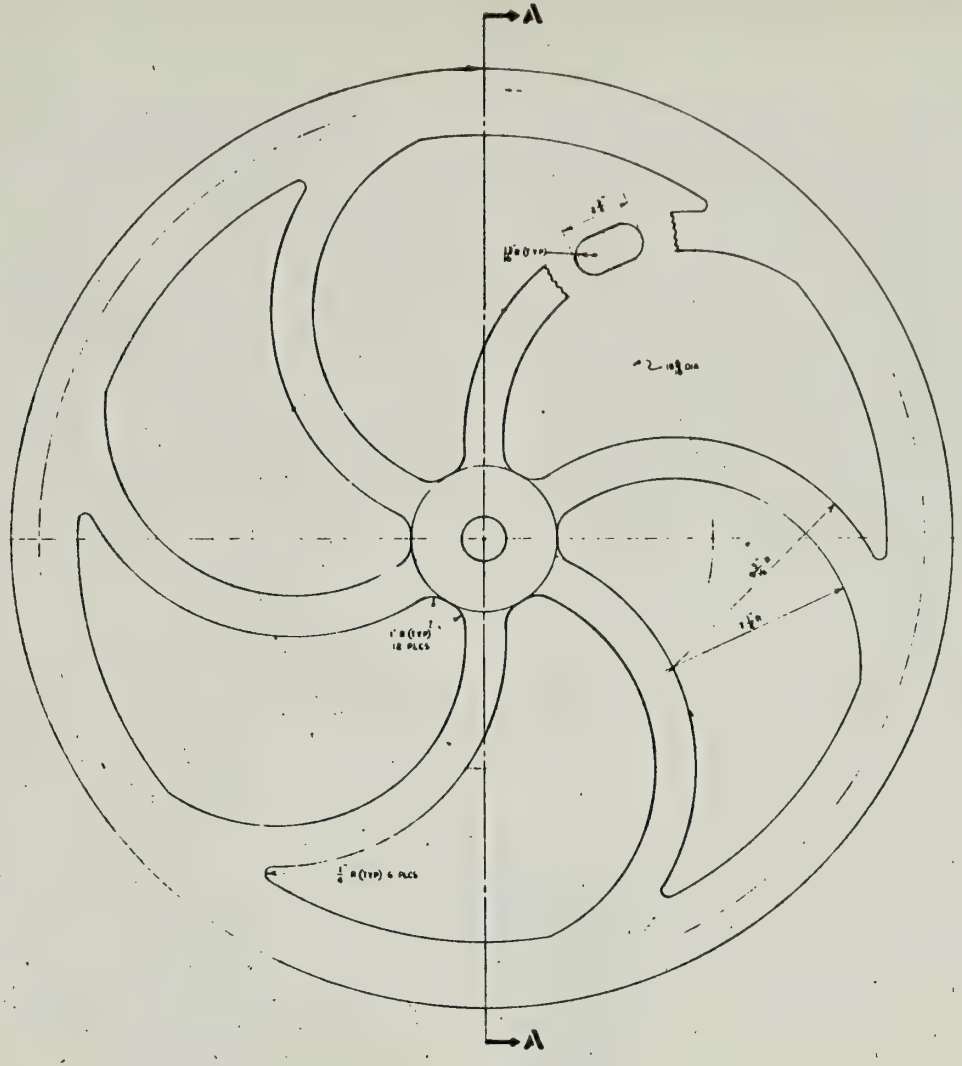
42" DIA. CROWN PULLEY

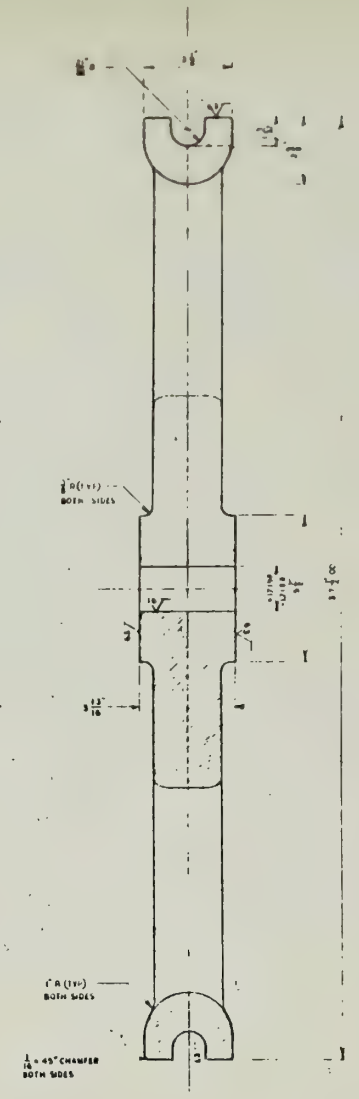
NO.	DATE	REVISIONS	BY	APP'D

WN | CMS | 2A | QUANTITY 128 | APPR. 1971

CL-5307 | D

FIGURE 2.4.e





NOTES

1 MATERIAL IS CAST STEEL ASTM A 148-66 CLASS 120-95 250 - 280 BHN

2 TOLERANCE IS ± 1/16" ON CASTINGS AND ± 1/32" ON MACHINING EXCEPT WHERE NOTED

3 PATTERN NO (567) MUST BE CAST ON SIDE OF RIM IN 1/2" SIZE RAISED NUMBERS

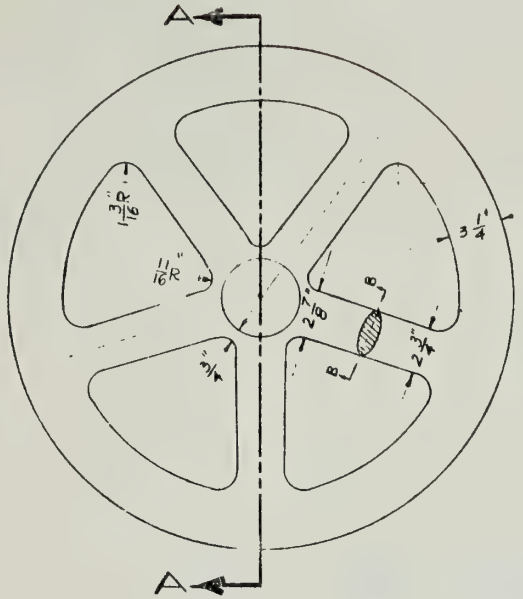
4 WEIGHT IS 300 LB.

CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY

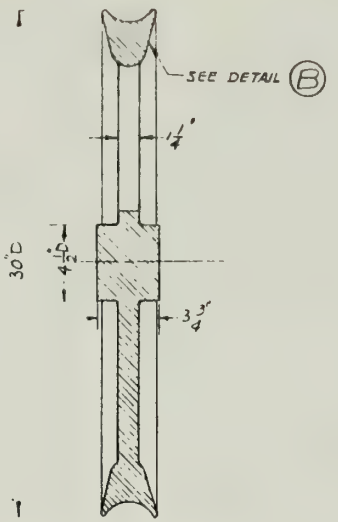
39" CROWN PULLEY

DL-4612 | 0

FIGURE 2.4.f



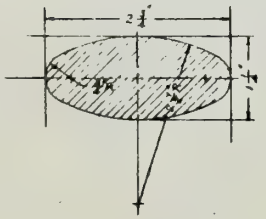
SCALE : 1/4" = 1"



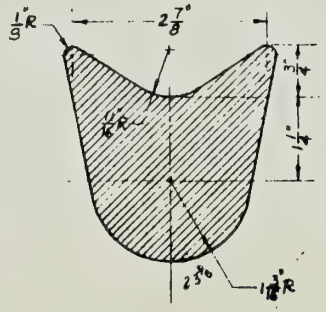
SECTION A-A

NOTES

1. THIS DWG MADE FROM ROUGH CASTING
2. PATTERN NO 484 . AVAILABLE AT ELKTON PATTERN SHOP
3. APPROX. WEIGHT — 180 lb.
4. MATERIAL — CAST IRON



SEC. B-B



DETAIL (B)
SCALE : FULL SIZE

CONTRACT NO. M.R.

CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
SAN FRANCISCO MUNICIPAL RAILWAY

30" CROWN PULLEY

AS DRAWN
8-15-51

a-5442

REVISIONS

FIGURE 2.4.g

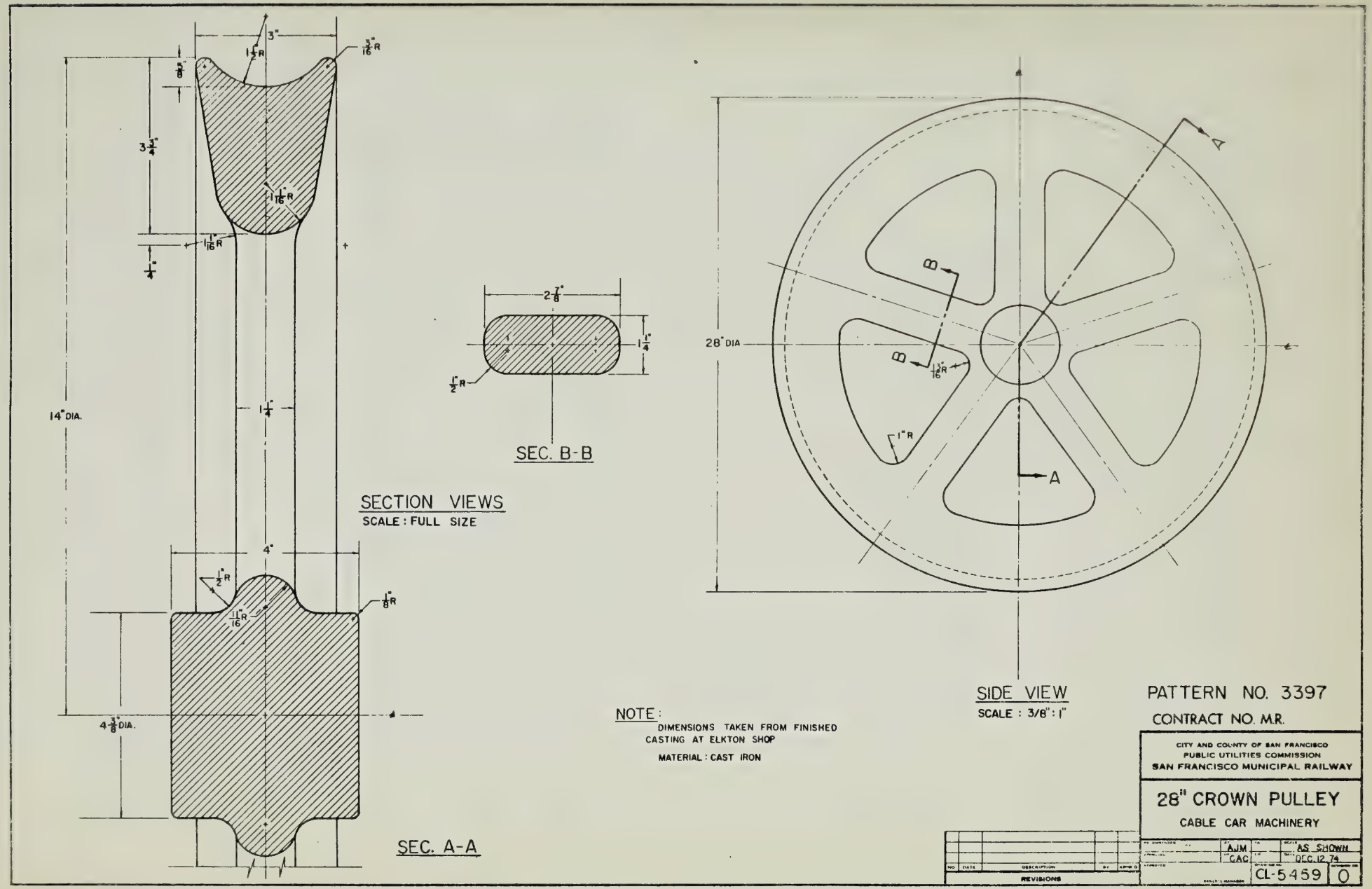
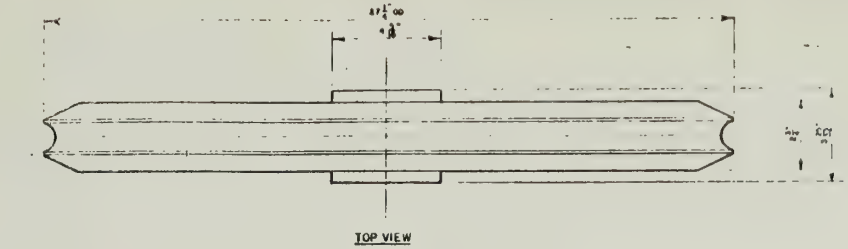
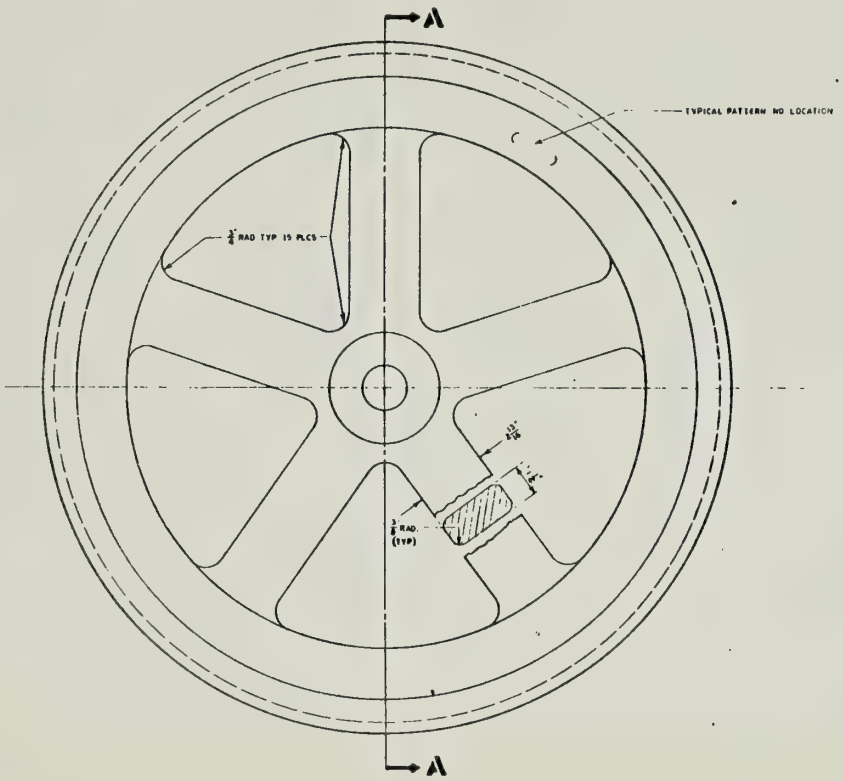

3"
1 1/2"R
3/16"R
5/8"
3 3/4"
1 1/16"R
1 1/16"R
1/4"
14"DIA.
1 1/4"
4"
1/2"R
1 1/16"R
1/8"R
4 3/8"DIA.
SEC. A-A
2 1/8"
1 1/4"
1/2"R
SEC. B-B
SECTION VIEWS
SCALE : FULL SIZE
28"DIA
A
B
B
3/16"R
1"R
A
SIDE VIEW
SCALE : 3/8" : 1"
NOTE :
DIMENSIONS TAKEN FROM FINISHED CASTING AT ELKTON SHOP
MATERIAL : CAST IRON
PATTERN NO. 3397
CONTRACT NO. M.R.
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
SAN FRANCISCO MUNICIPAL RAILWAY
28" CROWN PULLEY
CABLE CAR MACHINERY
REVISIONS
AJM
CAC
AS SHOWN
DEC. 12, 74
CL-5459
0

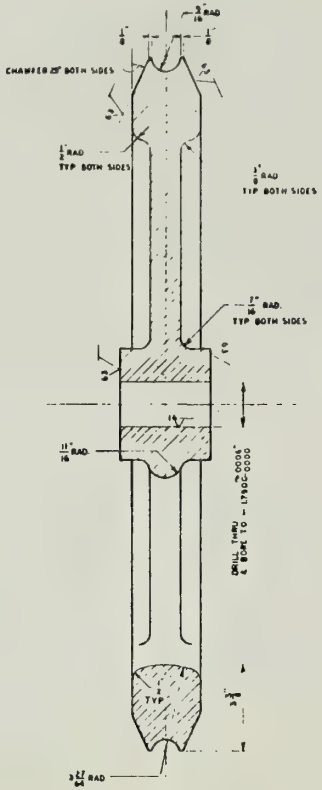
FIGURE 2.4.h



TOP VIEW



SIDE VIEW



SECTION A-A

CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY

28' CROWN PULLEY

DL-4610 | 0

FIGURE 2.4.i

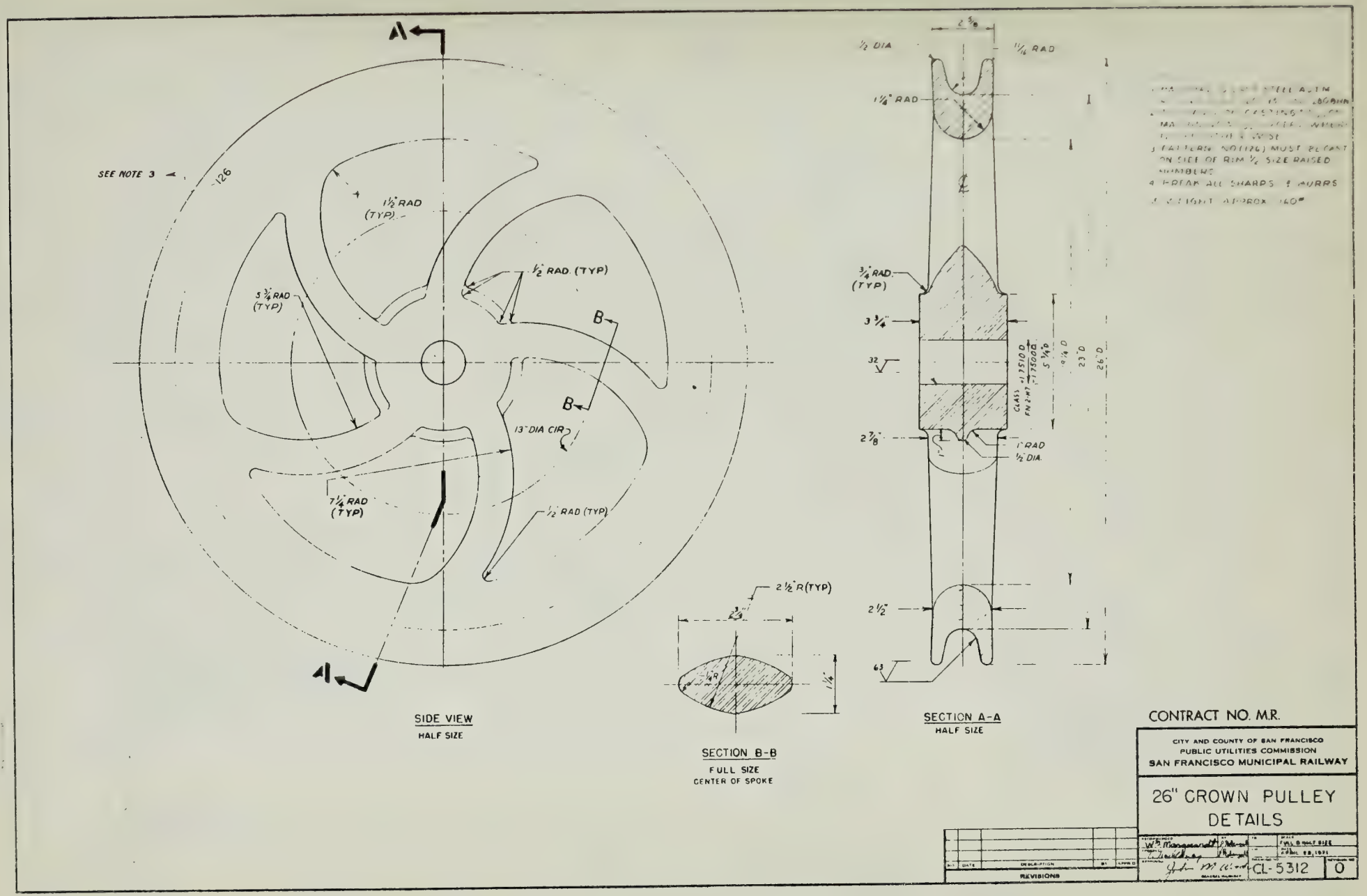

SEE NOTE 3
126
1½ RAD (TYP)
½ RAD. (TYP)
5¾ RAD (TYP)
B
B
13" DIA CIR
7¼ RAD (TYP)
½ RAD (TYP)
SIDE VIEW
HALF SIZE
2½ R (TYP)
¼R
1¼
SECTION B-B
FULL SIZE
CENTER OF SPOKE
½ DIA
1¼ RAD
1¼" RAD
¾" RAD (TYP)
3¼"
32
2⅞"
1" RAD
½" DIA.
2½"
63
CLASS 1.3510 D
FN 2 MT 1.75000
5¼ D
23" D
26" D
SECTION A-A
HALF SIZE
CONTRACT NO. M.R.
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
SAN FRANCISCO MUNICIPAL RAILWAY
26" CROWN PULLEY
DETAILS
REVISIONS
CL-5312
0

FIGURE 2.4.j

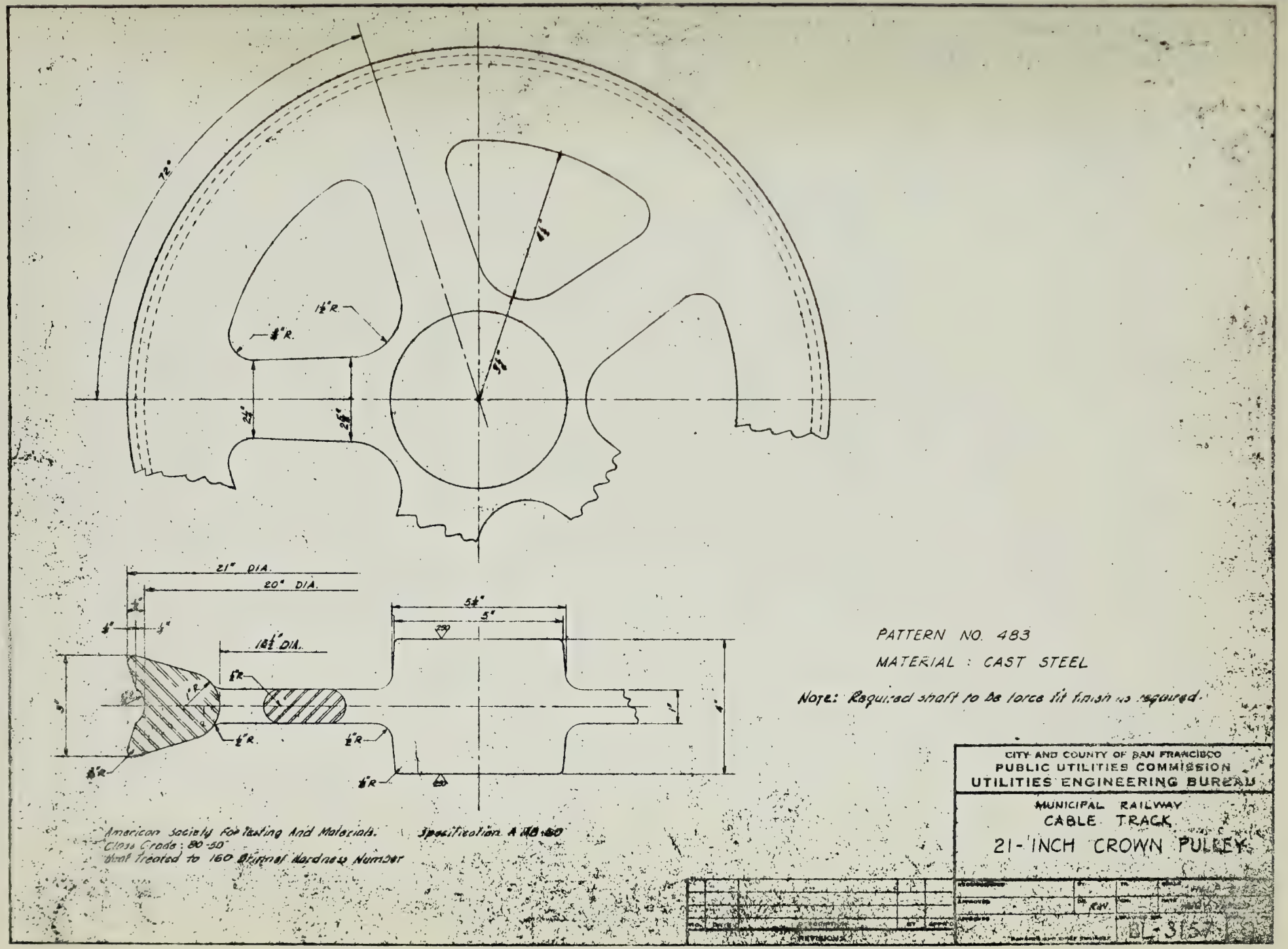

72°
1½"R.
¾"R.
24"
25"
51°
21" DIA.
20" DIA.
5¼"
5"
18½" DIA.
1"R.
½"R.
½"R.
¾"R.
¾"R.
PATTERN NO. 483
MATERIAL : CAST STEEL
Note: Required shaft to be force fit finish as required.
American Society For Testing And Materials. Specification A 148-50
Class Grade : 80-50
Heat Treated to 160 Brinnel Hardness Number
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY
CABLE TRACK
21-INCH CROWN PULLEY
BL-315

FIGURE 2.4.k

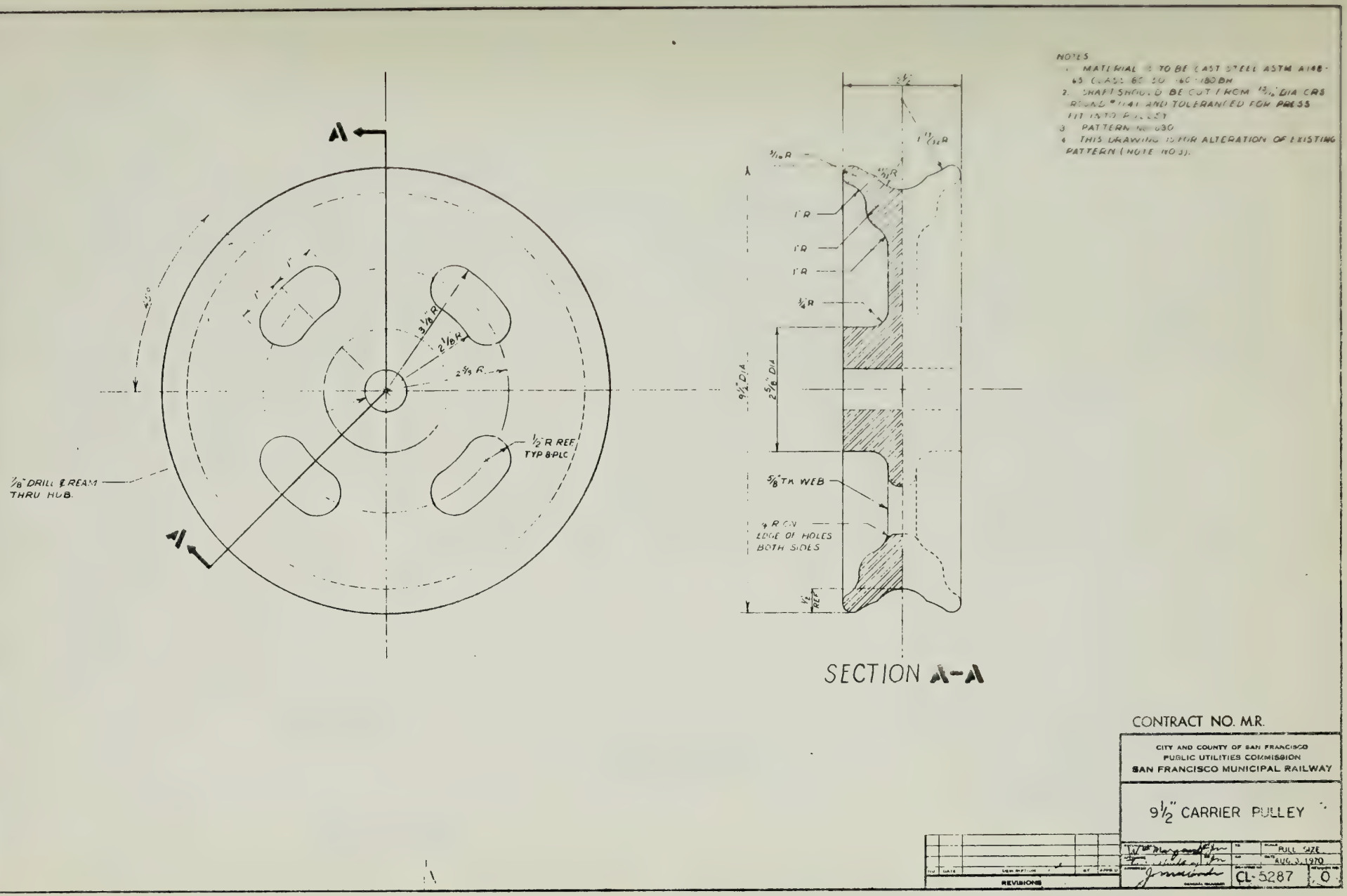

NOTES
1. MATERIAL TO BE CAST STEEL ASTM A148-63 CLASS 80-50-160-180 BH
2. SHAFT SHOULD BE CUT FROM 13/16" DIA CRS ROUND PER 1141 AND TOLERANCED FOR PRESS FIT INTO PULLEY
3. PATTERN NO. 630
4. THIS DRAWING IS FOR ALTERATION OF EXISTING PATTERN (NOTE NO 3).
A
A
45°
3 1/16 R
2 1/8 H
2 5/8 R
1/2 R REF TYP 8 PLC
1/8" DRILL & REAM THRU HUB
2 1/2
1 11/16 R
3/16 R
1/16 R
1" R
1" R
1" R
1/4 R
9 1/2" DIA
2 5/8" DIA
5/8" TH WEB
1/4 R ON EDGE OF HOLES BOTH SIDES
1/2"
SECTION A-A
CONTRACT NO. M.R.
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
SAN FRANCISCO MUNICIPAL RAILWAY
9 1/2" CARRIER PULLEY
REVISIONS
FULL SIZE
AUG. 2, 1970
CL-5287
0

FIGURE 2.4.1

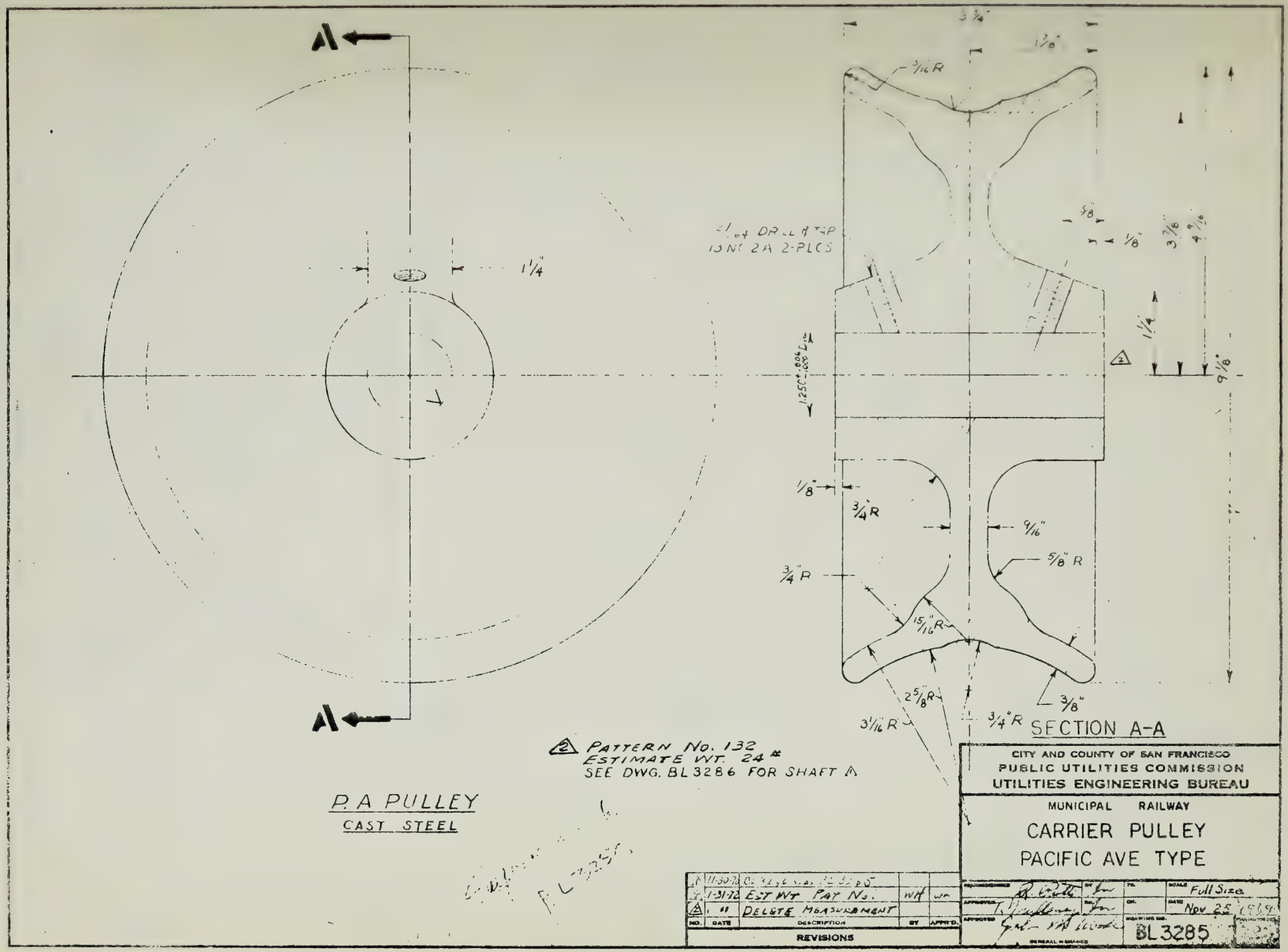
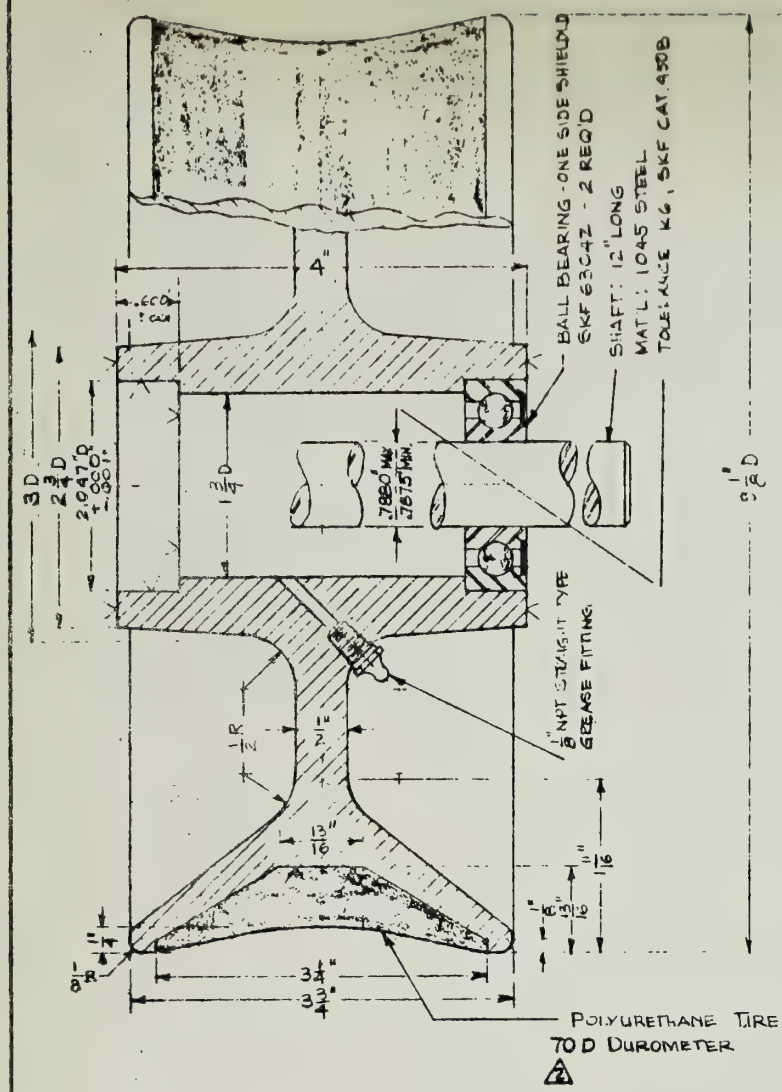
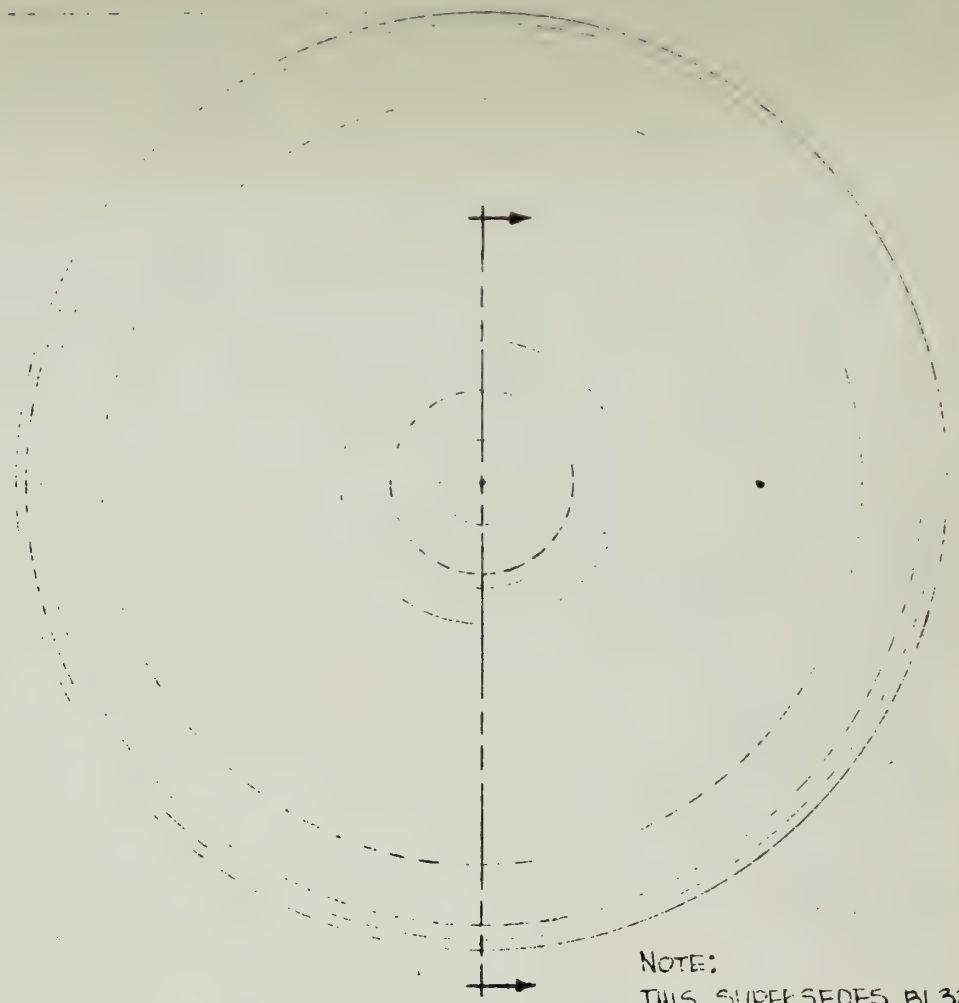

A
A
1 1/4"
4 HOLES
SECTION A-A
3/16 R
1/8"
3/4"R
3/4"R
9/16"
5/8" R
15/16"R
2 5/8"R
3/16 R
3/8"
3/4"R
1/8"
3/8
4 9/16
1/4
9 1/8"
1.250 ± .005 DIA
4 HOLES DRILLED TAP
13 NC 2A 2-PLCS
2 PATTERN NO. 132
ESTIMATE WT. 24 #
SEE DWG. BL 3286 FOR SHAFT A
P. A PULLEY
CAST STEEL
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY
CARRIER PULLEY
PACIFIC AVE TYPE
REVISIONS
NO. DATE DESCRIPTION BY APPR'D.
1 11-30-72 ESTIMATE WT. PAT. NO. WH WA
2 1-31-72 ESTIMATE WT. PAT. NO. WH WA
3 11 DELETE MEASUREMENT
DRAWN R. Wall
TR. Full Size
CH.
APPROVED T. Pullman
DATE Nov 25 1969
APPROVED
DRAWING NO. BL 3285

FIGURE 2.4.m





NOTE:
THIS SUPERSEDES BL3285, AL2935
CONTRACT NO. M.R.

PULLEY
MATERIAL
CAST ALUMINUM ALLOY
356 HEAT TREATED T-51
66 BHN

CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
SAN FRANCISCO MUNICIPAL RAILWAY

CABLE MACHINERY

P.A. CARRIER PULLEY w/
BALL BRGS. & POLYURETHANE TIRE

NO.	DATE	DESCRIPTION	BY	APP'D.
2	8-24-78	CHG 95 Dur. to 70 D	GY	EP
1	9-5-78	SHAFT DIA AS SHOWN INSTEAD OF 7/8"	AM	

REVISIONS

DRAWN	AM	SCALE	FULL
APPROVED	AM	DATE	10-17-77
DEPUTY GENERAL MANAGER		DRAWING NO.	BL-3256
		REVISION NO.	2

FIGURE 2.4.n

Attachment 2.4.A

SHEAVES

8, 10, 12 ft

No.	Location Code	Location	Line	Incoming	Outgoing	Tail	10 ft	12 ft	8 ft
1-M-4	Ma 1194	Cable Barn	P/M #59	X			X		
2-H-3	Ma 1195	Cable Barn	Hyde #60	X			X		
3-H-1	Ma 1196	Cable Barn	Hyde #60		X		X		
4-P-1	Ma 1197	Cable Barn	P/M #59		X				X
5-C-8	Ma 1198	Cable Barn	Calif #61	X			X		
6-C-1	Ma 1199	Cable Barn	Calif #61		X		X		
7-C-6	Ca 0000	Calif. & Drumm	Calif #61			X	X		
8-C-1	Ma 901	Calif. & Mason	Calif #61		X		X		
9-C-7	Ma 900	Calif. & Mason	Calif #61	X			X		
10-C-4	Ca 1402	Calif. & Hyde	Calif #61		X		X		
11-C-5	Ca 1689	Calif. & Van Ness	Calif #61			X	X		
12-C-3	Hy 1577	Hyde & Pacific	Calif #61			X		X	
13-H-3	Hy 2829	Hyde & Beach	Hyde #60		X			X	
14-H-4	Hy 2886	Victoria Park	Hyde #60			X	X		
15-M-3	Ta 2490	Bay & Taylor	P/M #59			X	X		
16-P-2	Po 0001	Powell & Market	P/M #59			X	X		
17-H-2	Po 1088	Powell & Wash.	Hyde #60		X		X		

SHEAVE INSPECTION

Sheave Code Number	1-M-4				
Location	Ma 1194 Cable Barn				
Hatch Cover	Wood		Welded	Riveted	
Hatch Frame	Good		Fair	Poor	
Ladder	Good		Fair	Poor	
Grease Guns	Good	X	Fair	Poor	
Grease Lines	Good	X	Fair	Poor	
Sheave Size	10 Foot	X	12 Foot	Other	
Sheave Condition	Good	X	Fair	Poor	
Sheave Hub & Spokes		Cast Iron		Steel X Fab	
Sheave Segments		Cast Iron		Steel X Fab	
Hub & Spoke Cond.	Good	X	Fair	Poor	
Segment Condition	Good	X	Fair	Poor	
Sheave Bearings	Babbitt		Brass X		
Sheave Bearings	Good	X	Fair	Poor	
Sheave Type		California X		Thomas	
"U" Frame Type		California		Thomas X	
"U" Frame Support	Good		Fair	X Poor	
Vault Condition	Good	X	Fair	Poor	
Vault Lighting	Good	X	Fair	Poor	
Crown Pulley	Yes		No	Size	
Hold Down Pulley	Yes		No	Size	
Pulley Condition	Good		Fair	Poor	
Pulley Bearings	Babbitt		Brass	Antifriction	
Pulley Material	Cast Iron		Steel	Eur. Alum.	
Pulley Support	Good		Fair	Poor	

Additional Remarks: - Incoming Powell/Mason

SHEAVE INSPECTION

Sheave Code Number	2-H-5			
Location	Ma 1195 Cable Barn			
Hatch Cover	Wood	Welded	Riveted	
Hatch Frame	Good	Fair	Poor	
Ladder	Good	Fair	Poor	
Grease Guns	Good	X Fair	Poor	
Grease Lines	Good	X Fair	Poor	
Sheave Size	10 Foot	X 12 Foot	Other	
Sheave Condition	Good	Fair	X Poor	
Sheave Hub & Spokes		Cast Iron X	Steel	
Sheave Segments		Cast Iron X	Steel	
Hub & Spoke Cond.	Good	X Fair	Poor	
Segment Condition	Good	Fair	X Poor	
Sheave Bearings	Babbitt	X Brass		
Sheave Bearings	Good	Fair	X Poor	
Sheave Type		California	Thomas X	
"U" Frame Type		California	Thomas X	
"U" Frame Support	Good	X Fair	Poor	
Vault Condition	Good	X Fair	Poor	
Vault Lighting	Good	X Fair	Poor	
Crown Pulley	Yes	No	Size	
Hold Down Pulley	Yes	No	Size	
Pulley Condition	Good	Fair	Poor	
Pulley Bearings	Babbitt	Brass	Antifriction	
Pulley Material	Cast Iron	Steel	Eur. Alum.	
Pulley Support	Good	Fair	Poor	
Additional Remarks:			- Incoming Hyde	

SHEAVE INSPECTION

Sheave Code Number	3-H-1				
Location	Ma 1196 Cable Barn				
Hatch Cover	Wood		Welded	Riveted	
Hatch Frame	Good		Fair	Poor	
Ladder	Good		Fair	Poor	
Grease Guns	Good	X	Fair	Poor	
Grease Lines	Good	X	Fair	Poor	
Sheave Size	10 Foot	X	12 Foot	Other	
Sheave Condition	Good	X	Fair	Poor	
Sheave Hub & Spokes		Cast Iron		Steel X Fab	
Sheave Segments		Cast Iron		Steel X Fab	
Hub & Spoke Cond.	Good	X	Fair	Poor	
Segment Condition	Good	X	Fair	Poor	
Sheave Bearings	Babbitt		Brass	X	
Sheave Bearings	Good	X	Fair	Poor	
Sheave Type		California	X	Thomas	
"U" Frame Type		California		Thomas	X
"U" Frame Support	Good		Fair	X Poor	
Vault Condition	Good	X	Fair	Poor	
Vault Lighting	Good	X	Fair	Poor	
Crown Pulley	Yes		No	Size	
Hold Down Pulley	Yes		No	Size	
Pulley Condition	Good		Fair	Poor	
Pulley Bearings	Babbitt		Brass	Antifriction	
Pulley Material	Cast Iron		Steel	Eur. Alum.	
Pulley Support	Good		Fair	Poor	
Additional Remarks:				- Outgoing Hyde	

SHEAVE INSPECTION

Sheave Code Number	4-F-1			
Location	Ma 1197 Cable Barn			
Hatch Cover	Wood	____Welded	____Riveted	____
Hatch Frame	Good	____Fair	____Poor	____
Ladder	Good	____Fair	____Poor	____
Grease Guns	Good	X Fair	____Poor	____
Grease Lines	Good	X Fair	____Poor	____
Sheave Size	10 Foot	____12 Foot	____Other	8'
Sheave Condition	Good	____Fair	X Poor	____
Sheave Hub & Spokes		Cast Iron X	Steel ____	
Sheave Segments		Cast Iron X	Steel ____	
Hub & Spoke Cond.	Good	X Fair	____Poor	____
Segment Condition	Good	____Fair	X Poor	____
Sheave Bearings	Babbitt	____Brass	X	
Sheave Bearings	Good	____Fair	X Poor	____
Sheave Type		California____	Thomas X	
"U" Frame Type		California____	Thomas Pedestal	
"U" Frame Support	Good	____Fair	X Poor	____
Vault Condition	Good	X Fair	____Poor	____
Vault Lighting	Good	X Fair	____Poor	____
Crown Pulley	Yes	____No	____Size	____
Hold Down Pulley	Yes	____No	____Size	____
Pulley Condition	Good	____Fair	____Poor	____
Pulley Bearings	Babbitt	____Brass	____Antifriction	____
Pulley Material	Cast Iron	____Steel	____Eur. Alum.	____
Pulley Support	Good	____Fair	____Poor	____
Additional Remarks:	Outgoing Powell/Mason			

SHEAVE INSPECTION

Sheave Code Number	5-C-8				
Location	Ma 1198 Cable Barn				
Hatch Cover	Wood		Welded	Riveted	
Hatch Frame	Good		Fair	Poor	
Ladder	Good		Fair	Poor	
Grease Guns	Good	X	Fair	Poor	
Grease Lines	Good	X	Fair	Poor	
Sheave Size	10 Foot	X	12 Foot	Other	
Sheave Condition	Good		Fair	X Poor	
Sheave Hub & Spokes		Cast Iron X		Steel	
Sheave Segments		Cast Iron X		Steel	
Hub & Spoke Cond.	Good		Fair	X Poor	
Segment Condition	Good		Fair	X Poor	
Sheave Bearings	Babbitt		Brass	X	
Sheave Bearings	Good	X	Fair	Poor	
Sheave Type		California		Thomas X	
"U" Frame Type		California		Thomas X	
"U" Frame Support	Good		Fair	X Poor	
Vault Condition	Good	X	Fair	Poor	
Vault Lighting	Good	X	Fair	Poor	
Crown Pulley	Yes		No	Size	
Hold Down Pulley	Yes		No	Size	
Pulley Condition	Good		Fair	Poor	
Pulley Bearings	Babbitt		Brass	Antifriction	
Pulley Material	Cast Iron		Steel	Eur. Alum.	
Pulley Support	Good		Fair	Poor	

Additional Remarks: - Incoming California

SHEAVE INSPECTION

Sheave Code Number	6-C-1			
Location	Ma 1199 Cable Barn			
Hatch Cover	Wood		Welded	Riveted
Hatch Frame	Good		Fair	Poor
Ladder	Good		Fair	Poor
Grease Guns	Good	X	Fair	Poor
Grease Lines	Good	X	Fair	Poor
Sheave Size	10 Foot	X	12 Foot	Other
Sheave Condition	Good		Fair	X Poor
Sheave Hub & Spokes		Cast Iron	X	Steel
Sheave Segments		Cast Iron	X	Steel
Hub & Spoke Cond.	Good		Fair	X Poor
Segment Condition	Good		Fair	X Poor
Sheave Bearings	Babbitt		Brass	X
Sheave Bearings	Good	X	Fair	Poor
Sheave Type		California		Thomas X
"U" Frame Type		California		Thomas X
"U" Frame Support	Good		Fair	X Poor
Vault Condition	Good	X	Fair	Poor
Vault Lighting	Good	X	Fair	Poor
Crown Pulley	Yes		No	Size
Hold Down Pulley	Yes		No	Size
Pulley Condition	Good		Fair	Poor
Pulley Bearings	Babbitt		Brass	Antifriction
Pulley Material	Cast Iron		Steel	Eur. Alum.
Pulley Support	Good		Fair	Poor
Additional Remarks:				- Outgoing California

SHEAVE INSPECTION

Sheave Code Number						
Location	Ca 000 California & Drumm					
Hatch Cover	Wood		Welded	X	Riveted	
Hatch Frame	Good	X	Fair		Poor	
Ladder	Good	X	Fair		Poor	
Grease Guns	Good	X	Fair		Poor	
Grease Lines	Good	X	Fair		Poor	
Sheave Size	10 Foot	X	12 Foot		Other	
Sheave Condition	Good	X	Fair		Poor	
Sheave Hub & Spokes		Cast Iron		Steel	X	
Sheave Segments		Cast Iron		Steel	X	
Hub & Spoke Cond.	Good	X	Fair		Poor	
Segment Condition	Good	X	Fair		Poor	
Sheave Bearings	Babbitt		Brass	X		
Sheave Bearings	Good		Fair		Poor	X
Sheave Type		California	X	Thomas		
"U" Frame Type		California	X	Thomas		
"U" Frame Support	Good		Fair	X	Poor	
Vault Condition	Good		Fair	X	Poor	
Vault Lighting	Good		Fair	X	Poor	
Crown Pulley	Yes	X	No		Size	R
Hold Down Pulley	Yes		No		Size	
Pulley Condition	Good		Fair		stopped Poor	X
Pulley Bearings	Babbitt		Brass	X	Antifriction	
Pulley Material	Cast Iron	X	Steel		Eur. Alum.	
Pulley Support	Good		Fair		Poor	X

Additional Remarks. Bearings-Lower Warm-Upper hot--Ceiling poor-one section of brickwork is fractured-Tail Sheave.

SHEAVE INSPECTION

Sheave Code Number	8-C-2					
Location	Ma 901 Mason & California					
Hatch Cover	Wood		Welded	X	Riveted	
Hatch Frame	Good	X	Fair		Poor	
Ladder	Good	X	Fair		Poor	
Grease Guns	Good	X	Fair		Poor	
Grease Lines	Good	X	Fair		Poor	
Sheave Size	10 Foot	X	12 Foot		Other	
Sheave Condition	Good	G	Fair		Poor	
Sheave Hub & Spokes		Cast Iron		Steel	X Fab.	
Sheave Segments		Cast Iron		Steel	X Fab	
Hub & Spoke Cond.	Good	X	Fair		Poor	
Segment Condition	Good	X	Fair		Poor	
Sheave Bearings	Babbitt		Brass	X		
Sheave Bearings	Good	X	Fair		Poor	
Sheave Type		California	X	Thomas		
"U" Frame Type		California		Thomas	X	
"U" Frame Support	Good	X	Fair		Poor	
Vault Condition	Good	X	Fair		Poor	
Vault Lighting	Good	X	Fair		Poor	
Crown Pulley	Yes	X	No		Size	2
Hold Down Pulley	Yes		No		Size	
Pulley Condition	Good	X	Fair		Poor	
Pulley Bearings	Babbitt		Brass		Antifriction	X
Pulley Material	Cast Iron	X	Steel		Eur. Alum.	
Pulley Support	Good	X	Fair		Poor	

Additional Remarks: Outgoing Cal. Exposed beams need cleaning and painting.

SHEAVE INSPECTION

Sheave Code Number	9-C-7			
Location	Ma 900 Mason & California			
Hatch Cover	Wood	___ Welded	X Riveted	___
Hatch Frame	Good	X Fair	___ Poor	___
Ladder	Good	X Fair	___ Poor	___
Grease Guns	Good	X Fair	___ Poor	___
Grease Lines	Good	X Fair	___ Poor	___
Sheave Size	10 Foot	X 12 Foot	___ Other	___
Sheave Condition	Good	G Fair	___ Poor	___
Sheave Hub & Spokes		Cast Iron ___	Steel X Fab.	
Sheave Segments		Cast Iron ___	Steel X Fab.	
Hub & Spoke Cond.	Good	X Fair	___ Poor	___
Segment Condition	Good	X Fair	___ Poor	___
Sheave Bearings	Babbitt	___ Brass	X	
Sheave Bearings	Good	X Fair	___ Poor	___
Sheave Type		California X	Thomas ___	
"U" Frame Type		California ___	Thomas X	
"U" Frame Support	Good	X Fair	___ Poor	___
Vault Condition	Good	X Fair	___ Poor	___
Vault Lighting	Good	X Fair	___ Poor	___
Crown Pulley	Yes	___ No	___ Size	___
Hold Down Pulley	Yes	X No	___ Size	14"
Pulley Condition	Good	X Fair	___ Poor	___
Pulley Bearings	Babbitt	___ Brass	___ Antifriction	X
Pulley Material	Cast Iron	___ Steel	X Eur. Alum.	___
Pulley Support	Good	X Fair	___ Poor	___

Additional Remarks: incoming Cal 90°. Hold down could be raised so rope would be centered. Exposed Beams need painting - Rusty.

SHEAVE INSPECTION

Sheave Code Number	10-C-4
Location	Ca 1402 California & Hyde
Hatch Cover	Wood ___ Welded X Riveted ___
Hatch Frame	Good X Fair ___ Poor ___
Ladder	Good X Fair ___ Poor ___
Grease Guns	Good X Fair ___ Poor ___
Grease Lines	Good X Fair ___ Poor ___
Sheave Size	10 Foot X 12 Foot ___ Other ___
Sheave Condition	Good X Fair ___ Poor ___
Sheave Hub & Spokes	Cast Iron X Steel ___
Sheave Segments	Cast Iron X Steel ___
Hub & Spoke Cond.	Good X Fair ___ Poor ___
Segment Condition	Good X Fair ___ Poor ___
Sheave Bearings	Babbitt ___ Brass X
Sheave Bearings	Good X Fair ___ Poor ___
Sheave Type	California X Thomas ___
"U" Frame Type	California X Thomas ___
"U" Frame Support	Good X Fair ___ Poor ___
Vault Condition	Good X Fair ___ Poor ___
Vault Lighting	Good X Fair ___ Poor ___
Crown Pulley	Yes ___ No ___ Size ___
Hold Down Pulley	Yes X No ___ Size ___ 20
Pulley Condition	Good X Fair ___ Poor ___
Pulley Bearings	Babbitt ___ Brass ___ Antifriction X
Pulley Material	Cast Iron X Steel ___ Eur. Alum. ___
Pulley Support	Good X Fair ___ Poor ___
Additional Remarks:	Strand alarm Beams need cleani painting-Raise hold down to center rope ingro Bend Cal Rope 90°.

SHEAVE INSPECTION

Sheave Code Number	11-C-5					
Location	Ca 1689 California & Van Ness					
Hatch Cover	Wood		Welded	X	Riveted	
Hatch Frame	Good	X	Fair		Poor	
Ladder	Good	X	Fair		Poor	
Grease Guns	Good	X	Fair		Poor	
Grease Lines	Good	X	Fair		Poor	
Sheave Size	10 Foot	X	12 Foot		Other	
Sheave Condition	Good	X	Fair		Poor	
Sheave Hub & Spokes		Cast Iron	X	Steel		
Sheave Segments		Cast Iron		Steel	X	
Hub & Spoke Cond.	Good	X	Fair		Poor	
Segment Condition	Good	X	Fair		Poor	
Sheave Bearings	Babbitt		Brass	X		
Sheave Bearings	Good	X	Fair		Poor	
Sheave Type		California	X	Thomas		
"U" Frame Type		California	X	Thomas		
"U" Frame Support	Good	X	Fair		Poor	
Vault Condition	Good		Fair	X	Poor	
Vault Lighting	Good		Fair		Poor	X
Crown Pulley	Yes		No		Size	
Hold Down Pulley	Yes		No		Size	
Pulley Condition	Good		Fair		Poor	
Pulley Bearings	Babbitt		Brass		Antifriction	
Pulley Material	Cast Iron		Steel		Eur. Alum.	
Pulley Support	Good		Fair		Poor	

Additional Remarks: Tail sheave

Exposed wiring-Only operating bulb in fuse box.

SHEAVE INSPECTION

Sheave Code Number	12-C-3			
Location	Hy 1577 Hyde & Pacific			
Hatch Cover	Wood	Welded	X Riveted	
Hatch Frame	Good	X Fair	Poor	
Ladder	Good	X Fair	Poor	
Grease Guns	Good	X Fair	Poor	
Grease Lines	Good	X Fair	Poor	
Sheave Size	10 Foot	12 Foot	X Other	
Sheave Condition	Good	Fair	X Poor	
Sheave Hub & Spokes	Cast Iron X	Steel		
Sheave Segments	Cast Iron X	Steel		
Hub & Spoke Cond.	Good	X Fair	Poor	
Segment Condition	Good	Fair	X Poor	
Sheave Bearings	Babbitt	Brass X		
Sheave Bearings	Good	X Fair	Poor	
Sheave Type	California X	Thomas		
"U" Frame Type	California X	Thomas		
"U" Frame Support	Good	X Fair	Poor	
Vault Condition	Good	X Fair	Poor	
Vault Lighting	Good	Fair	Poor	X
Crown Pulley	Yes	No	Size	
Hold Down Pulley	Yes	No	Size	
Pulley Condition	Good	Fair	Poor	
Pulley Bearings	Babbitt	Brass	Antifriction	
Pulley Material	Cast Iron	Steel	Eur. Alum.	
Pulley Support	Good	Fair	Poor	

Additional Remarks: Beams need cleaning & painting

No lights-drain open, tail sheave on Cal Rope

Bend Cal Rope 90°.

SHEAVE INSPECTION

Sheave Code Number	13-H-3			
Location	Hy 2828 Hyde & Beach			
Hatch Cover	Wood	Welded	X Riveted	
Hatch Frame	Good	X Fair	Poor	
Ladder	Good	X Fair	Poor	
Grease Guns	Good	X Fair	Poor	
Grease Lines	Good	X Fair	Poor	
Sheave Size	10 Foot	12 Foot	X Other	
Sheave Condition	Good	Fair	X Poor	
Sheave Hub & Spokes		Cast Iron X	Steel	
Sheave Segments		Cast Iron X	Steel	
Hub & Spoke Cond.	Good	X Fair	Poor	
Segment Condition	Good	Fair	X Poor	
Sheave Bearings	Babbitt	Brass X		
Sheave Bearings	Good	X Fair	Poor	
Sheave Type		California X	Thomas	
"U" Frame Type		California X	Thomas	
"U" Frame Support	Good	X Fair	Poor	
Vault Condition	Good	X Fair	Poor	
Vault Lighting	Good	Fair	Poor	X
Crown Pulley	Yes	No	Size	
Hold Down Pulley	Yes	X No	Size	20"
Pulley Condition	Good	X Fair	Poor	
Pulley Bearings	Babbitt	Brass	Antifriction	X
Pulley Material	Cast Iron	X Steel	Eur. Alum.	
Pulley Support	Good	X Fair	Poor	

Additional Remarks: No lights - 12' Sheave-

Bend rope 90° to table

SHEAVE INSPECTION

Sheave Code Number	14-H-4			
Location	Hy 2886 Victoria Park			
Hatch Cover	Wood	Welded	X Riveted	
Hatch Frame	Good	X Fair	Poor	
Ladder	Good	X Fair	Poor	
Grease Guns	Good	X Fair	Poor	
Grease Lines	Good	X Fair	Poor	
Sheave Size	10 Foot	X 12 Foot	Other	
Sheave Condition	Good	Fair	X Poor	
Sheave Hub & Spokes		Cast Iron	Steel X	
Sheave Segments		Cast Iron X	Steel	
Hub & Spoke Cond.	Good	X Fair	Poor	
Segment Condition	Good	Fair	X Poor	
Sheave Bearings	Babbitt	Brass X		
Sheave Bearings	Good	Fair	Poor	X
Sheave Type		California X	Thomas	
"U" Frame Type		California X	Thomas	
"U" Frame Support	Good	X Fair	Poor	
Vault Condition	Good	X Fair	Poor	
Vault Lighting	Good	X Fair	Poor	
Crown Pulley	Yes	No	Size	
Hold Down Pulley	Yes	No	Size	
Pulley Condition	Good	Fair	Poor	
Pulley Bearings	Babbitt	Brass	Antifriction	
Pulley Material	Cast Iron	Steel	Eur. Alum.	
Pulley Support	Good	Fair	Poor	

Additional Remarks: lower bearing hot-standa

alarm-Tail sheave

SHEAVE INSPECTION

Sheave Code Number	15-M-I				
Location	Ta 2490 Bay & Taylor				
Hatch Cover	Wood		Welded	Riveted	X
Hatch Frame	Good		Fair	Poor	X
Ladder	Good		Fair	X Poor	
Grease Guns	Good	X	Fair	Poor	
Grease Lines	Good	X	Fair	Poor	
Sheave Size	10 Foot	X	12 Foot	Other	
Sheave Condition	Good	X	Fair	Poor	
Sheave Hub & Spokes		Cast Iron X		Steel	
Sheave Segments		Cast Iron X		Steel	
Hub & Spoke Cond.	Good	X	Fair	Poor	
Segment Condition	Good	X	Fair	Poor	
Sheave Bearings	Babbitt		Brass	X	
Sheave Bearings	Good		Fair	Hot X Poor	
Sheave Type		California		Thomas X	
"U" Frame Type		California X		Thomas	
"U" Frame Support	Good	X	Fair	Poor	
Vault Condition	Good		Fair	Poor	X
Vault Lighting	Good		Fair	Poor	X
Crown Pulley	Yes	X	No	Size	PA
Hold Down Pulley	Yes		No	Size	
Pulley Condition	Good		Fair	X Poor	
Pulley Bearings	Babbitt	X	Brass	Antifriction	
Pulley Material	Cast Iron		Steel	X Bur. Alum.	
Pulley Support	Good	X	Fair	Poor	

Additional Remarks: No lights - Bearings very warm-Tail Sheave.

SHEAVE INSPECTION

Sheave Code Number	16-P-2			
Location	Po 0001 Powell & Market			
Hatch Cover	Wood	Welded	X Riveted	
Hatch Frame	Good	Fair	X Poor	
Ladder	Good	X Fair	Poor	
Grease Guns	Good	X Fair	Poor	
Grease Lines	Good	X Fair	Poor	
Sheave Size	10 Foot	X 12 Foot	Other	
Sheave Condition	Good	X Fair	Poor	
Sheave Hub & Spokes		Cast Iron X	Steel	
Sheave Segments		Cast Iron X	Steel	
Hub & Spoke Cond.	Good	X Fair	Poor	
Segment Condition	Good	X Fair	Poor	
Sheave Bearings	Babbitt	X Brass		
Sheave Bearings	Good	X Fair	Poor	
Sheave Type		California	Thomas X	
"U" Frame Type		California	Thomas X	
"U" Frame Support	Good	Fair	X Poor	
Vault Condition	Good	Fair	X Poor	
Vault Lighting	Good	X Fair	Poor	
Crown Pulley -	Yes	No	Size	
Hold Down Pulley	Yes	No	Size	
Pulley Condition	Good	Fair	Poor	
Pulley Bearings	Babbitt	Brass	Antifriction	
Pulley Material	Cast Iron	Steel	Eur. Alum.	
Pulley Support	Good	Fair	Poor	
Additional Remarks:		Tail Sheave		

SHEAVE INSPECTION

Sheave Code Number	17-H-2			
Location	Pa 1088 Powell & Washington			
Hatch Cover	Wood	Welded	Riveted	X
Hatch Frame	Good	Fair	Poor	X
Ladder	Good X	Fair	Poor	
Grease Guns	Good X	Fair	Poor	
Grease Lines	Good X	Fair	Poor	
Sheave Size	10 Foot X	12 Foot	Other	
Sheave Condition	Good	Fair	Poor	X
Sheave Hub & Spokes		Cast Iron X	Steel	
Sheave Segments		Cast Iron X	Steel	
Hub & Spoke Cond.	Good	Fair	Poor	X
Segment Condition	Good	Fair	Poor	X
Sheave Bearings	Babbitt X	Brass		
Sheave Bearings	Good	Fair	X Poor	
Sheave Type		California	Thomas X	
"U" Frame Type		California	Thomas X	
"U" Frame Support	Good	Fair	X Poor	
Vault Condition	Good	Fair	Poor	X
Vault Lighting	Good	Fair	Poor	X
Crown Pulley	Yes	No	Size	
Hold Down Pulley	Yes X	No	Size	
Pulley Condition	Good X	Fair	Poor	
Pulley Bearings	Babbitt	Brass	Antifriction	X
Pulley Material	Cast Iron X	Steel	Eur. Alum.	
Pulley Support	Good X	Fair	Poor	
Additional Remarks:	Patches on sheave - Outgoing Hyde			

SHEAVE INSPECTION

Sheave Code Number				
Location	Powell & Washington			
Hatch Cover	Wood	____ Welded	____ Riveted	X
Hatch Frame	Good	____ Fair	____ Poor	X
Ladder	Good	X Fair	____ Poor	
Grease Guns	Good	X Fair	____ Poor	
Grease Lines	Good	X Fair	____ Poor	
Sheave Size	10 Foot	X 12 Foot	____ Other	
Sheave Condition	Good	X Fair	____ Poor	
Sheave Hub & Spokes		Cast Iron X	Steel ____	
Sheave Segments		Cast Iron ____	Steel X	
Hub & Spoke Cond.	Good	X Fair	____ Poor	
Segment Condition	Good	X Fair	____ Poor	
Sheave Bearings	Babbitt	X Brass	____	
Sheave Bearings	Good	X Fair	____ Poor	
Sheave Type		California ____	Thomas X	
"U" Frame Type		California ____	Thomas X	
"U" Frame Support	Good	____ Fair	X Poor	
Vault Condition	Good	____ Fair	____ Poor	X
Vault Lighting	Good	____ Fair	____ Poor	X
Crown Pulley	Yes	____ No	____ Size	
Hold Down Pulley	Yes	____ No	____ Size	
Pulley Condition	Good	____ Fair	____ Poor	
Pulley Bearings	Babbitt	____ Brass	____ Antifriction	
Pulley Material	Cast Iron	____ Steel	____ Eur. Alum.	
Pulley Support	Good	____ Fair	____ Poor	
Additional Remarks:	Not in use. Formerly incoming			

Powell

SHEAVE INSPECTION

Sheave Code Number				
Location	Powell & Washington			
Hatch Cover	Wood	Welded	Riveted	X
Hatch Frame	Good	Fair	Poor	X
Ladder	Good	X Fair	Poor	
Grease Guns	Good	Fair	Poor	
Grease Lines	Good	Fair	Poor	
Sheave Size	10 Foot	12 Foot	Other	6'
Sheave Condition	Good	X Fair	Poor	
Sheave Hub & Spokes		Cast Iron X	Steel	
Sheave Segments		Cast Iron X	Steel	
Hub & Spoke Cond.	Good	X Fair	Poor	
Segment Condition	Good	X Fair	Poor	
Sheave Bearings	Babbitt	Brass X		
Sheave Bearings	Good	X Fair	Poor	
Sheave Type		California	Thomas	
"U" Frame Type		California	Thomas	
"U" Frame Support	Good	Fair	Poor	
Vault Condition	Good	Fair	Poor	X
Vault Lighting	Good	Fair	Poor	X
Crown Pulley	Yes	No	Size	
Hold Down Pulley	Yes	No	Size	
Pulley Condition	Good	Fair	Poor	
Pulley Bearings	Babbitt	Brass	Antifriction	
Pulley Material	Cast Iron	Steel	Eur. Alum.	
Pulley Support	Good	Fair	Poor	

Additional Remarks: Not in use. Formerly outgoing Mason.

Section 2.5

DEPRESSION BEAMS

The 71 depression beams included, at the time of inspection, 47 of the Powell type, 22 of the Hyde type, one 1974 experimental modification of the Powell type, and one 1978 experimental modification of the Hyde type.

2.5.1 Description

Powell

Horizontal arm -- mild steel 2 x 1/2 in. frame (ASTM A36) enclosing with countersunk bolts two bronze castings (ASTM B22) and white-oak filler; 66 in. long, 2 to 6 in. wide, 2 in. deep. Pulley's -- 5 in. diameter, steel (ASTM A4140, BHN240-260), with antifriction bearings. Pin at rear support -- 7/8 in. counterweight lever arm -- mild steel (ASTM A36), 15-1/4 x 12-1/2 in. L-shaped plate. Counterweight -- cast iron, 252 cu in., 65 lb.

Hyde

Horizontal arm -- all steel welded construction (ASTM A36), except cast steel pulley housing; 72 in. long, 2 to 6-1/2 in. wide, 2 in. deep; in shape of horizontal I beam, with 2 x 3/8 in. flanges, 1/2 in. thick web, depth varying from 2-1/2 to 6-1/2 in. Pulleys (2) -- 5 in. diameter, steel (ASTM A4140, BHN240-260). Rear support pin -- 1-1/2 in. diameter. Vertical support leg -- 3 x 3 x 1/2 in. angle (ASTM A36), 28 in. long from top of

support leg -- 3 x 3 x 1/2 in. angle (ASTM A36), 28 in. long from top of arm to lower pivot point. Diagonal brace -- 1-1/4 in. round bar, flattened at each end at points of attachment to arm. Bottom support bracket -- L-shaped iron casting, with 7 in. vertical leg bolted to the 28 in. vertical leg, and 13 in. horizontal leg which reacts against spring; 1-1/8 in. pivot pin. Spring -- steel, 10 in. Assembly of horizontal arm, 28 in. vertical leg, diagonal brace, and pulley housing by bolting and riveting; reinforcing weldments added to some beams.

Modified Powell

Same as Powell, except arm of welded steel construction, with integrated bearing housing.

Modified Hyde

Horizontal arm -- 2-1/2 x 3 x 3/8 in. angle, (ASTM A36), 68 in. long, with 1 in. thick Nylatron GSM cam. Pulleys (2) -- 5 in. diameter; steel (ASTM A4140, BHN240-260), with shafts counterlevered from angle. Vertical leg -- two 2-1/2 x 3/8 in. Angle forming a channel section; 28 in. long from top of arm to bottom of channel. Support point at rear of arm and bottom of vertical leg -- 3/4-in. rod-end bolt joint.

2.5.2 Inspection

Powell (49 inspected, including replacement for experimental type out of service)

- Arm: 34 good -- cam surface not worn, bolts secure, pulley-mount casting securely fastened to arm and not worn; 6 fair -- cam surface somewhat worn, bolts secure, pulley-mount casting securely fastened but showing some abrasion by cable; 9 poor -- cam badly worn.
- Pulleys (by beam): 24 good -- rotating freely, antifriction bearings supporting the pulley properly; 8 fair -- rotating freely, antifriction bearings supporting the pulleys properly, but pulley surface worn by cable and cable not centered in groove; 17 poor -- not rotating and causing friction between pulley and cable, one or both antifriction bearings not supporting pulley, cable wearing groove at pulley edge.
- Support pins: 27 good -- rear pin and bracket snugly fitted and bracket securely fastened to yoke, rear pin securely fitted in tail of arm, and rear bracket securely fastened to yoke, close fit of frame and yoke anchor; 4 fair -- rear bracket securely fastened to yoke, close fit of bracket and yoke anchor, front bracket securely fastened to yoke, but loose fit of pin in arm:

18 poor -- front bracket securely fastened to yoke, but very loose fit of rear pin in arm.

Hyde (22 Inspected)

- Arm: 16 good -- cam surface not worn, pulley housing secure in arm and not worn; 6 fair -- cam surface somewhat worn, pulley housing secure in arm but showing some abrasion by cable.

- Pulleys (by beam): 18 good -- rotating freely, antifriction bearings supporting the pulley properly; 1 fair -- rotating freely, antifriction bearings supporting the pulleys properly, but pulley surface worn by cable or cable not centered in groove; 3 poor -- not rotating and causing friction between pulley and cable, one or both antifriction bearings not supporting pulley, cable wearing groove at pulley edge.

- Support pins: 3 good -- rear bracket snugly fastened and bracket hole snugly fitted with rear of arm; 3 fair -- bottom pin securely anchored to channel bottom and close fit between pivot arm pin and bottom anchor, front end bracket securely fastened to yoke, but loose fit between bracket and tail of beam; 16 poor -- flat key loosely fitted in tail of arm and bracket securely fastened to channel bottom, but wear has resulted in loose fit between pivot arm pin and channel bottom bracket.

2.5.3 Evaluation

Powell

Deflection of the beam's cover plate by truck wheels (H20 loading) create bending stresses in the cover plate about ten times the allowable. Of the 16,000 lb H20 wheel load, 13,500 are transmitted to the 10 in. wide plate (the wheel tread is about 12 in.) and since under H20 wheel loading the plate is supported on one side by hinges and on the other by the depression beam pulleys, half the 13,500 lbs are borne by the hinges and half by the pulleys. The beam is supported only at its end and the 6,750 lb loading occurs at about the quarter point of the span, producing a bending movement of 6 ft-kips, which is 4-1/2 times the 1.3 ft-kips bending movement the frame is designed to sustain. Considering that the beam was designed to support the 1200 lb load from the cable and that the bending stress produced by the load is within the allowable, it must be the installation of the beam and inadequate design of the cover plate that are responsible for the overstress from H20 loading.

Because the center line of the beam support is 2-1/8 in. off the center line of the pulleys, torsional movements of 2530 in./lbs from cable loading or 14,400 in./lbs from H20 loading are produced. This torsional movement is transmitted through the beam to, and is resisted by, the 7/8 in. diameter pin at the rear support point.

It creates wear at the rear pin support, and the wear allows rotation of the beam. As a result of rotation, the beam can become jammed in the channel-shaped support in which the front end slides after the grip passes, and the jammed beam will catch the grip of the next car, bringing the car to a sudden halt. To prevent jamming, the rear support pin and its bushing should be replaced frequently and a snug fit maintained.

The composite wood and steel construction of the beam affords poor resistance to torsional loads imposed by H20 loading. On beams brought into the cable car barn for servicing, the frames are often twisted and it is evident that a snug fit of the support pins is not being maintained.

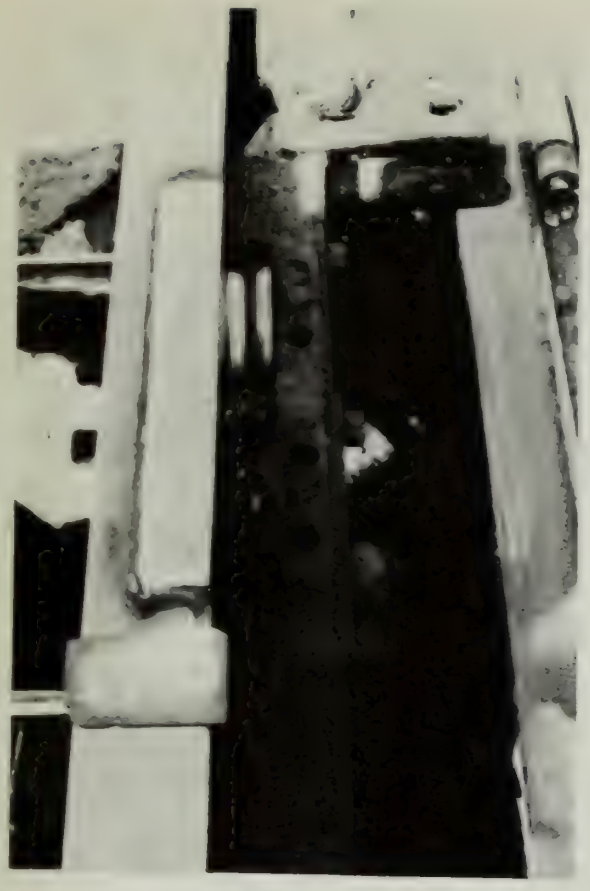
The steel frame of the beam on the grip side is curved to provide a smooth cam action for the grip shank. A prime reason for failure in the beam is fracturing of the frame where it is weakened by bolt holes, and accidents occur when the grip shank and center plate get caught between the frame and wood filler, bringing the car to a sudden stop. Methods of repairing the beam contribute to metal fatigue and fracture. Every time the bolts are removed to disassemble the parts, a bent beam is straightened, and the sections are bolted together again the metal is weakened. Frequently, care is not taken to be sure that the heads of countersunk

bolts do not protrude from the surface of the cam, with the result that the grip shank strikes the bolt heads.

Hyde

As the Powell beam, the Hyde was not designed for H20 loading which is imposed on the pulleys through the cover plate, but the increase in size of the vertical leg angle bar from 3 x 3 x 3/8 in. to 3 x 3 x 1/2 in. reduces calculated overstress from 80 percent to 40 percent. Size of the bolts attaching the vertical support leg to the bottom pivot has been changed from 2-7/16 to 2-3/4 in. -- one bolt in a fitted hole and one in a slotted hole -- reducing calculated overstress from 125 percent to 50 percent. The six 5/8 in. machine screws that attached the cast-steel pulley frame to the beam (three of which also secure the beam to the vertical leg) were changed to 3/4 in. rivets, which were later reinforced by welding; evidence of failures in both rivets and welds were observed in out-of-service beams inspected at the barn. The loads transmitted through the rivets to the vertical leg produce tension shearing and bending stresses, resulting in calculated overstress of 120 percent.

Illustrations



Stopped pulleys on Powell type depression beams (upper left and right) and pulleys out of alignment on Hyde type beam (lower).

Section 2.6

RAIL

Among the more than eleven types of running rail in the system are 35 lb, 45 lb, 50 lb, 70 lb, 75 lb, and 100 lb Tee rail, and 55 lb, 96 lb, 106 lb, 107 lb, and 110 lb Trilby (girder). Most running rail is 50 lb Tee and 55 lb Trilby.

Slot rail includes 38 lb and 40 lb slot, 7 in. Z-bar slot, and 1/2 x 3-1/2 x 5 in. angle.

There are 19 turnouts and crossovers.

2.6.1 Description (major types); see Figure 2.6.a.

50 lb Tee

Height, 3-5/8 in.; base width, 3-5/8 in.; head depth, about 1-1/8 in.; head width, 2-1/4 in.; web thickness, 5/8 in.; plate, 3/4 in. flat and angle, 18 in. long.

55 lb Trilby

Height, 3-1/2 in.; base width, 4 in.; head depth, about 1-1/8 in.; head width, 2-3/16 in.; flange width, 1-5/8 in.; web thickness, 3/8 in.

40 lb Slot

Height, 4-7/8 in., head width, 2-9/16 in.; web thickness, 9/16 in.

Z-bar Slot

Cast steel. Height, 7 in. (variable); base width, 3 in.

(variable); head width, 2-1/2 in. (variable); web thickness, 5/8 in. (variable). Plate, 5/8 in. flat, 22 in. long.

Angle (for slot)

Height, 5 in.; width, 3-1/2 in.; thickness, 1/2 in.; weight, 13.6 lb/ft.

Turnouts

Highly diversified; specifications unavailable.

2.6.2 Inspection

Running Rail (1653 locations)

Condition criteria (based on the shortened -- 11/32 in. -- wheel flange currently in use); see Figure 2.6.a: Good -- head smooth, flat, more than about 1/2 in. in depth, and not chipped at gauge line; fair -- head surface uneven or wavy, less than about 1/2 in. in depth, with a burr developing at outer edge; poor -- head surface very uneven, less than about 1/4 in. in depth, and chipped at gauge line, and (on Trilby) wheel flange running in bottom of flange groove.

Inspection results:

- Outside rail -- 387 good, 277 fair, 982 poor.
- Inside rail -- 341 good, 337 fair, 975 poor.

Bowing and gaps between butts observed at various locations.

Slot Rail (1543 locations)

Condition criteria: Good -- corrosion insignificant, no damage from grip blades, able to support vehicular traffic; fair -- significant corrosion, flame-cut to remove slot blade; poor -- considerable corrosion, long sections flame-cut to widen slot where bent by vehicular traffic or other causes.

Inspection results: 960 good, 95 fair, 488 poor.

Slot width uneven at most locations.

Turnouts and Crossovers (17 inspected; one at Washington and Hyde sts included under Section 2.8, Pull Curves)

- o Switch, mate, and frog rails

  Condition criteria: same as running rail

  Inspection results: Switch rails -- 7 good, 2 fair, 8 poor; mate rails -- 8 good, 2 fair, 7 poor; frog rails -- 4 good, 5 fair, 8 poor.

- o Switch tongues

  Condition criteria: Good -- straight, flat, little wear at curved gauge line, snug fit between tongue shank and hole in casting where tongue is

anchored; fair -- straight, flat, some wear at curved gauge line, loose fit between tongue shank and hole; poor -- bent, uneven, considerable wear at curved gauge line, loose fit between tongue shank and hole.

Inspection results: 4 good, 1 fair, 7 poor.

- Slot guides

  Condition criteria: Good -- snug fit at pivot point, little wear by grips, good alignment when shifted from straight to curved slot; fair -- some movement at pivot points, some wear by grips, good alignment; poor -- loose fit at pivot points, considerable wear by grips, incorrect alignment.

  Inspection results: 5 good, 5 fair, 2 poor.

- Slot points

  Condition criteria: Good -- level with slot rail, aligned with slot, 11/16 in. radius; fair -- not level with slot rail, aligned with slot, some wear by grips, poor -- not level with slot rail, misaligned with slot, considerable wear by grips.

  Inspection results: 12 good, 2 fair, 3 poor.

Further inspection was made by a consulting railway engineer, with the following results (see Attachment 2.6.A):

- California and Drumm sts (turnout)
  Guard faces, gauge corners, flangeways, frog intersections worn.
- California and Hyde sts (upper crossover turnout)
  Tongue switch good; flange bearing area of mate worn; slot frog on main run shows signs of having been broken and needs reinforcement.
- California and Hyde sts (lower crossover turnout)
  Generally fair condition, except frog and other sections worn and need welding and grinding.
- California and Hyde sts (east turnout to Hyde)
  Generally fair condition, but slot rail joint apparently loose; minor welding and grinding needed.
- California and Hyde sts (west turnout from Hyde)
  Generally fair condition, but frog lacks flange bearing tread and needs welding.
- California St and Van Ness Av (turnout)
  Back-of-flange bearing of tongue unpronounced, needs welding; mate, frog, and slot rail worn and need to be built up; slot point high and vibrates.
- Washington and Hyde sts (pull curve and crossing combined)
  Rail, guard, and other elements worn beyond repair.

- Hyde St between Washington and Jackson sts (turnout)

  Generally poor conditions -- frog broken, joint at head of frog has failed, and toe joint of mate shows signs of failure; mate and spring tongue switch in fair condition.

- Hyde and Jackson sts (upper crossover turnout)

  Generally fair condition, but some welding needed.

- Hyde and Jackson sts (lower crossover turnout)

  Generally fair condition, but welding and grinding needed.

- Filbert and Hyde sts (lower crossover turnout)

  Out of service; piece of rail head on frog broken; unused flangeways and slots welded shut; mate and jump mate appear to be in good condition.

- Filbert and Hyde sts (upper crossover turnout)

  Out of service; switch and mate have been removed and flangeways welded shut.

- Jackson St between Mason and Taylor sts (turnout)

  Generally sound, but switch has crack.

- Washington St between Mason and Taylor sts (turnout)

  Generally poor condition; frog and one slot frog on main running rail broken.

- Washington and Mason sts (turnout)

Generally good condition, but minor welding required in mate flangeway.

- Washington St between Powell and Mason sts (crossover)
  Mates and switch badly worn.
- Mason and Jackson sts (crossing)
  Good condition.
- Powell St between Washington and Jackson sts (turnout)
  Switch and mate worn and need welding; tongue down and does not provide proper guidance for back of flange; slot frogs and center rail frog worn.
- Powell and Washington sts (turnout)
  Generally poor condition. Mate, jump mate, and jump frog worn and need welding.

2.6.3 Evaluation

Running Rail

Deterioration, including wear, has created a high potential for derailment on at least one third of the track. The 11/32 in. cable car wheel flange is too short and a major factor causing derailment. That derailment occurs frequently is indicated by gouged pavement at many locations (see Section 2.7).

Wear of rail heads in the system is due primarily to

age; no other cause is discernible. Chipping at the gauge line is due to age and the temperature differential between the rail and welds produced by arc welding. Loose rail is attributable to corroded yoke and fastenways and poor maintenance. Bowing is probably due to thermal expansion that is unrestrained because of gaps between butts. Juxtaposition of different types of rail precludes the tight fitting that would eliminate bowing.

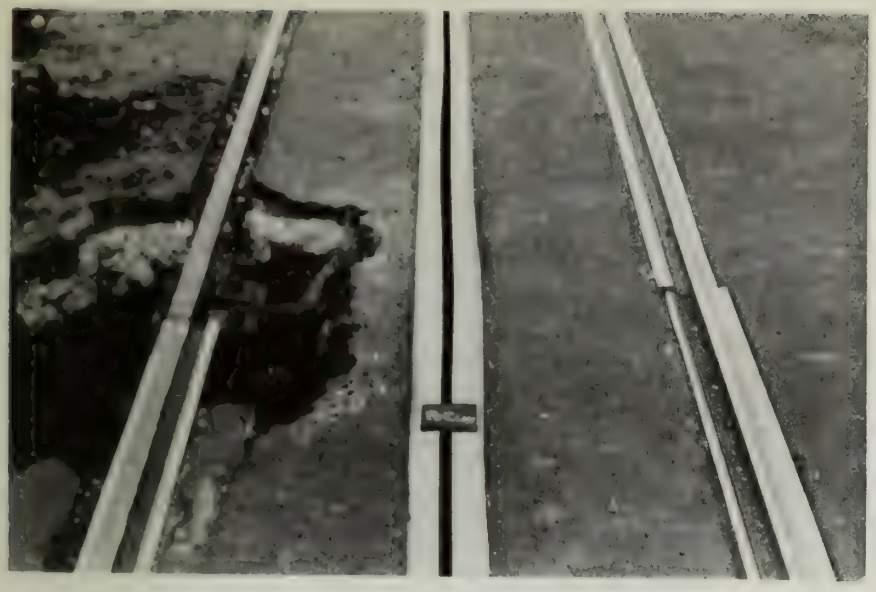
Slot Rail

Gaps between sections and squared-off butts increase the possibility of loose rail becoming displaced and catching the grip. Juxtaposition of different types of slot rail precludes the tight fitting and leveling of butts that would reduce the hazard of displacement. Closed slots are due to corroded yokes and fastenings and (on the California line) thermal expansion of the adjacent pavement on hot days. Wear on the grip shank by the slot rail, and vice versa, is increased when the slot is too narrow.

Turnouts and Crossovers

Because of the diversity of the rail, switches, and other components, a worn or broken segment cannot be replaced without considerable work in the rest of the installation. All but three turnouts and crossovers can be retained if necessary, but repairs are needed on most and seven require extensive repair.

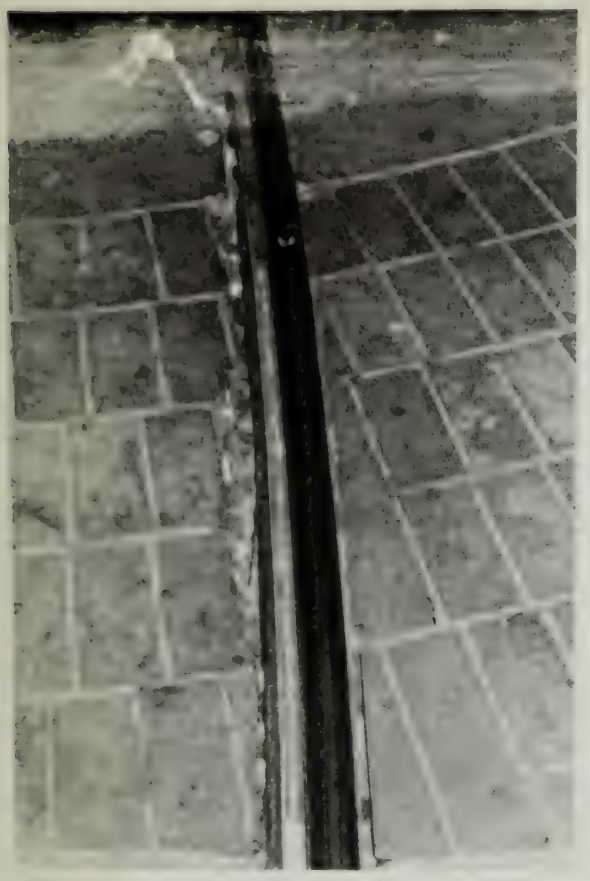
Illustrations



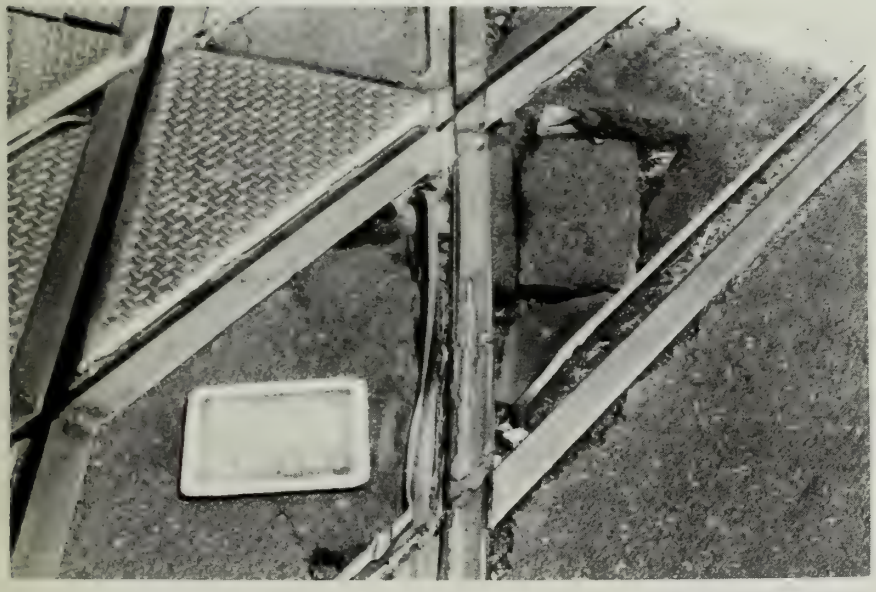
Different types of running rail (Powell near Clay).

Bowing of rail, probably due to deterioration of yoke or fastenings (Jackson between Powell and Mason).

Uneven slot width, with flame cutting of rail to widen slot (Hyde near Greenwich).



Gouging of brick pavement as a result of derailment (Powell near Market).



Deteriorated rail guard and running rail welded at gauge line (Hyde to Washington turnout).

Figures

	NUMBER	KIND OF RAIL	OUTLINE OF RAIL	DISTANCE BETWEEN BOLT HOLES IN PLATES	HEIGHT OF BOLT HOLES ABOVE RAIL BASE	BOND DRILLING	SIZE OF BOLTS	HEIGHT OF RAIL	WIDTH OF RAIL BASE	WIDTH OF RAIL BALL	WIDTH OF FLANGE FOR GUARD FROM GAGE LINE	THICKNESS OF RAIL WEB	DRAWING NO FOR RAIL DRILLING	DRAWING NO FOR RAIL SECTION	CATALOGUE NO. FOR RAIL	LENGTH OF PLATE	KIND OF PLATE	CAT NO. OF PLATE SECTION	REMARKS
1	141# TRILBY		See Sketch-A		SEE SKETCH "A" B.K. for special con.	1-5" 1-5½"	9"	6½"	3"	2 13/16"	9/16"	2053-0	3274 D.P. 2601	L.S.Co 141-395	36" — 34" —	Flat Cont. Uniform Depth	395	Plates same except Drilling Can use 106# Plates.
2	137# TRILBY		B		SEE SKETCH "B"	1-5"	9"	6½"	3"	2 13/16"	1/2"			-	32"	Flat		
3	119# GUARD		C		SEE SKETCH "C"	1-4"	9"	5½"	2¼"	2 13/16"	7/16"	2053-0	3274 D.P. 2601	L.S.Co 119-341	34 & 36"	Flat	333 340	Plates same. Inside Plates Fit In 85# & 96# Rails
4	109# TRILBY		C		SEE SKETCH "C"	1-4" 1-4½"	9"	5½"	2¼"	3 1/16"	7/16"	2053-0	3274 D.P. 2601	L.S.Co 109-340	34 & 36" 36"	Flat Cont.	333 340	Outside Plates Fit 106# RAIL FAIR-
5	108# BELGIAN GUARD		D		SEE SKETCH "D"	1-3¼"	8¾"	4 15/16"	2 3/16"	2½"	7/16"	1209-0		C.M.3	36"	Flat		In Plate Fits 8" Pa Wide 96# Groove Rail 2nd Plate Fits Belgian Block Rail Pa 5 - Except Drilling in Rail per Co. in Belgium.
6	106# TRILBY		C		SEE SKETCH "C"	1-4½" A.K. for Flat Plates	9"	5½"	2¼"	2 7/16"	13/32"	2053-0	SK No 173 2798 D.P. 2601	L.S.Co 106-422	36"	Cont.	206"2	
7	98# GUARD		C		SEE SKETCH "C"	1-4"	9"	4⅞"	2⅛"	2 3/8"	11/32"	2053-0		P.S. 98-230	34 & 36"	Flat		Some Plate - In Plate fits 112# Rail & also 109# Rail if good fit on 85#
8	85# GIRDER		C		SEE SKETCH "C"	1-4" 1-4¼"	9"	5"	2 1/16"	1 15/16"	3/8"	2053-0		P.S. 85-201	34 & 36" 36"	Flat Cont		
9	127# GUARD PARKSIDE		4-4-5-4-4 SEE SKETCH "E"	2 13/16"	SEE SKETCH "E"	1-4¼"	7 1/16"	5 9/16"	3"	3"	1/2"		D.P. 2601	L.S.Co 127-397	26"	Flat	393	Some Plate. Out Plate Fits Out T-96# & both T-112# - RAILS FAIR Except Drilling
10	114# TRILBY PARKSIDE		4-4-5-4-4 SEE SKETCH "E"	2 13/16"	SEE SKETCH "E"	1-4¼"	7 1/16"	5½"	3"	2 5/8"	15/32"		D.P. 2601	L.S.Co 114-393	26"	Flat	393	
11	107# TRILBY		SEE SKETCH "F" 4-4-5-4-4 - Flat 4-4-4-5-4-4-4 - Cont.	2 13/16"	SEE SKETCH "F"	1-4" 1-4½"	7"	5"	2¼"	2 7/8"	17/32"	2053-0	1214-0	P.S. 107-254	26"-6 Bolts 33"-8 Bolts 33"-8 Bolts	> Flat — Cont.		
12	107# GUARD		SEE SKETCH "F" 4-4-5-4-4	2 13/16"	SEE SKETCH "F"	1-4"	7"	4"	2⅛"	2 13/16"	7/16"	2053-0	D.P. 2601	L.S.Co 107-339	25"-6 Bolts 33"-8 Bolts	Flat	357	7" 96# Pl. Fit both T-107# Rails So these plates should be used. 107 Cent plate fits 96# Nat 117# Flat plate fits out 96# is slightly longer - 114 out plate fits 114# Rail "Fair" except drilling.
13	96# TRILBY		SEE SKETCH "F" 4-4-5-4-4 - Flat 4-4-4-5-4-4-4 - Cont.	2 13/16"	SEE SKETCH "F"	1-4" 1-4½"	7"	5"	2 3/16"	3"	7/16"	2053-0	1213-0 D.P. 2601	L.S.Co. 96-357	25"-6 Bolts 33"-8 Bolts 33"-8 Bolts	> Flat — Cont.	357	
14	92# GUARD		SEE SKETCH "G" 4-4-5-4-4	2 5/16"	NO BONDS	7/8-3½"	6"	3¾"	2"	2 5/16"	7/16"	2053-0	D.P. 2601	L.S.Co 92-220	26"	Flat	225	Used on Castle Track
15	83# GROOVE UNION ST. LINE						6 5/8"	6"	1¾"	1 11/16"	7/16"		SK No 281 D.P. 2601	L.S.Co 83-325			325	In Plate fits 6" T - Except Drilling
16	90# GROOVE CROSSING RAIL		SEE SKETCH "H"		SEE SKETCH "H"	7/8-3"	8 1/16"	4 15/16"	2¼"	1 5/8"	11/32"			P.S 90-259	24"	Flat		Cut Plate Fits 8" T - Not not Belgian
17	81# TRILBY		SEE SKETCH "L" 5"-6"-5"	1 3/8"	SEE SKETCH "L"	1-4½" Flat 1-5" Flat	4"	5 1/16"	2¼"	2 15/16"	7/16"	2207 SK. 221	2027-0 D.P. 2601	L.S.Co. 81-378	20"	Flat 1" CS 4 Atlas Cont.		Cast Steel Atlas Pls - Not good fit.
18	55# GROOVE CAL. ST. CABLE CO.		4"-5"-4"	1 5/16"	NO BONDS	3/4"	3½"	4"	2 3/16"	1 5/8"	3/8"		D.P. 2601	L.S.Co. 55-421				California St Cable new rail
19	121# TRILBY		SEE SKETCH "Z"		SEE SKETCH "Z"	1-4 3/16"	9"	6"	2 9/16"	2½"	7/16" & 9/16"	4013 2638	4013	L.S.Co 121-519	34 or 36"	Flat	206-2	No bond holes - Use electrically welded bonds - Use 112# plates
20	129# GUARD		SEE SKETCH "C"		SEE SKETCH "C"	1-4⅛"	9"	5½"	2¼"	2 13/16"	1/2"	2E38	D.P. 2601	L.S.Co 129-461	34 or 36"	Flat	206-2	Use 112# plates
21	110# TRILBY		SEE SKETCH "C"		SEE SKETCH "C"	1 1/16"-4¼"	9"	5½"	2¼"	1 7/8"	7/16 & 1/2		D.P. 2601	L.S.Co. 110-545	-	Flat	206-2	Supersedes L.S. 106-422
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GUARD GROOVE AND GIRDER RAILS

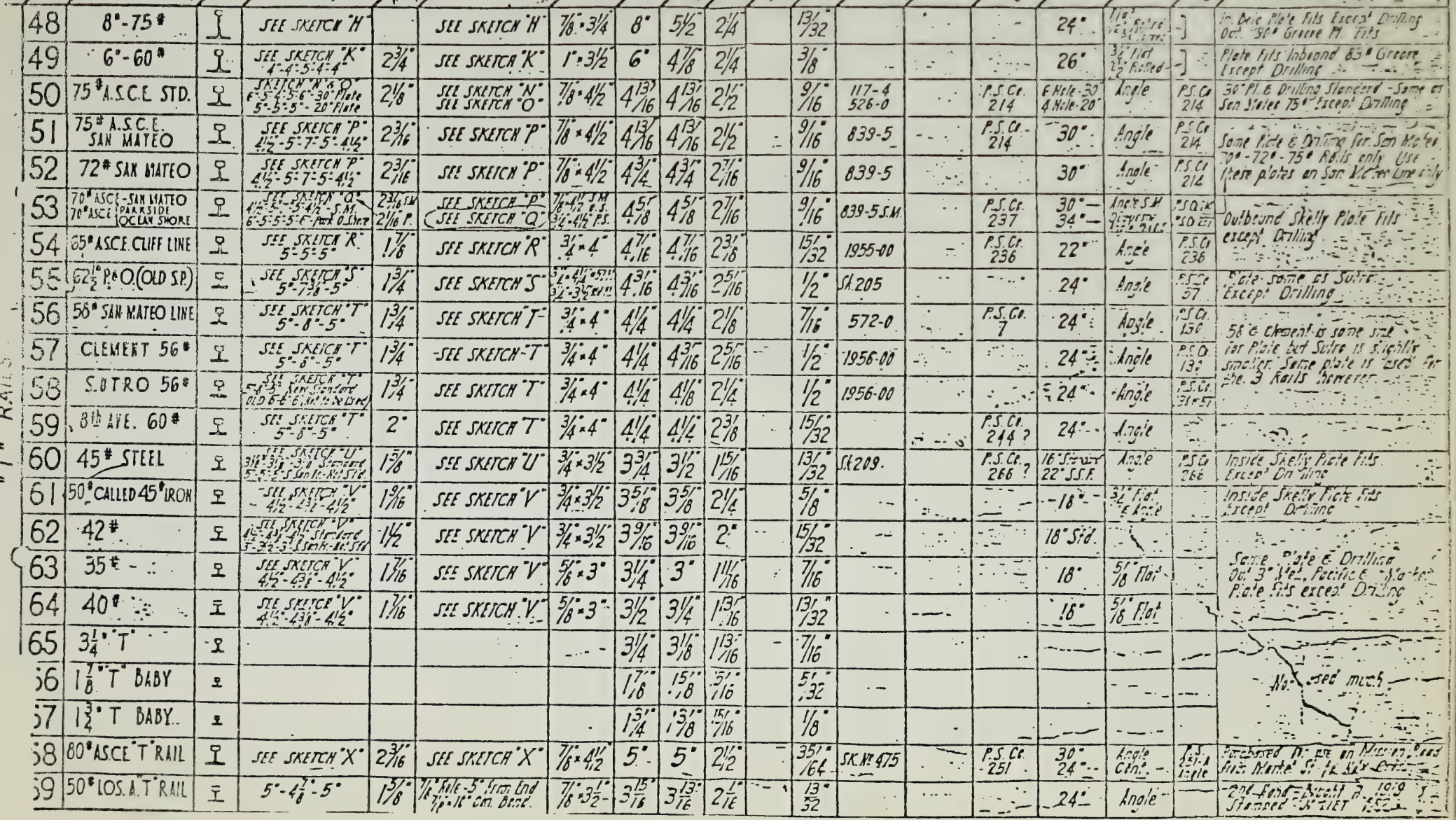
FIGURE 2.6.a

OLD AND MISCELLANEOUS RAILS

	NUMBER	KIND OF RAIL	OUTLINE OF RAIL	DISTANCE BETWEEN BOLT HOLES IN PLATES	HEIGHT OF BOLT HOLES ABOVE RAIL BASE	BOND DRILLING	SIZE OF BOLTS	HEIGHT OF RAIL	WIDTH OF RAIL BASE	WIDTH OF RAIL BALL	WIDTH OF FLANGE FOR GUARD FROM GAGE LINE	THICKNESS OF RAIL WEB	DRAWING NO. FOR RAIL DRILLING	DRAWING NO. FOR RAIL SECTION	CATALOGUE NO. FOR RAIL	LENGTH OF PLATE	KIND OF PLATE	CAT NO. OF PLATE SECTION	REMARKS
26	80 Z – 80#	J	See Sketch I		See Sketch I		7/8" × 2 3/4"	8"	3 1/2"	2 11/16"		13/32 17/32	SK. 214	1185-2		24"	Flat 5/8" Angle		8" T Rail Plate used with Flat Plate under Rail
27	6 1/16" Z	J	See Sketch J		NO BONDS		3/4" × 2 1/2"	6 1/16"	3"	2 1/4"		17/32 19/32	2053-0 566-0	B.P. 2611	L.S. Co. 62-233	15"	5/8" Flat		Used on Cable Slot
28	W.B. SKELLY – 70#	I	SKETCH "M" 4-5-4 Long Plate 4-5-4 Short Plate	1 5/8"	See Sketch "M"		3/4" × 3 3/4"	4 5/16"	3 1/4"	2 3/8"	2 1/2"	3/8"				6 Hole-26 4 Hole-18	7/8" Flat		Plates are same. Out Plate fits 85# Rails except drilling. In Plate fits 50° T. C.B. Johnstown City S.B. Johnstown Drilling & OK. for Johnstown Rails Only.
29	N.B. SKELLY – 62 1/2#	I	SKETCH "N" 4-5-4 Long Plate 4-5-4 Short Plate	1 5/8"	Ditto "M"		3/4" × 3 3/4"	4 5/16"	3 3/8"	2"	2 1/4"	5/16"				6 Hole-26 4 Hole-18	7/8" Flat		
30	C.B. JOHNSTOWN-72	I	SEE SKETCH "M" 4-5-4	1 5/8"	Ditto "M"		3/4" × 3 3/4"	4 1/4"	3 1/4"	1 3/4"	1 1/2"	3/8"	LBG. ON DR. № 2491	1175-0		18" 17"	7/8" Flat & Ass'l Angle		Plate Fits in S.B. System Both on Skellys & 50° T. Drilling OK except 50° T
31	S.B. JOHNSTOWN 51#	I	SEE SKETCH "M" 4-5-4	1 5/8"	Ditto "M"		3/4" × 3 3/4"	4 1/4"	3 3/4"	2 1/16"	1 1/2"	3/8"				18"	7/8" Flat		In Pl. Fits C.B. System Both on Skellys & 50° T. Drilling OK except 50° T.
32	3 9/16" P.I. – 45#	I	3 1/2" – 5 1/8" – 3 1/2"	1 5/16"	NO BONDS		5/8" × 3 1/2"	3 9/16"	2 7/8"	2"	1 3/4"	1/4"				17"	Flat 1" in 3/4" Cut		In Plate Fits Both On Rails
33	OMNIBUS – 51#	I	3 1/2" – 5 1/8" – 3 1/2"	1 1/4"	Ditto		3/4" × 3 3/4"	3 1/2"	3 1/8"	1 5/8"	3/4"	5/16"				17"	1" Flat		Plates Same
34	OMNIBUS SHEARED	I	3 1/2" – 5 1/8" – 3 1/2"	1 1/4"	Ditto		3/4" × 3 3/4"	3 1/2"	3 1/8"	1 5/8"	3/4"	5/16"				17"	1" Flat		
35	3 1/2" METROPOLITAN 40#	I	3 1/2" – 5 1/8" – 3 1/2"	1 1/8"	Ditto		3/4" × 3 3/4"	3 1/4"	2 7/8"	2"	1 1/4"	3/8"				17"	Flat 1" in 3/4" Cut		In Pl. Fits in 3" Met. Nickel & Pacific Rails – Out Pl. Fits 45° T – Except Drilling
36	3" METROPOLITAN	I	3 1/2" – 5 1/8" – 3 1/2"	1 1/8"	Ditto		3/4" × 3 3/4"	3"	2 3/4"	1 7/8"	1 1/4"	5/16"				17"	Flat 1" in 3/4" Cut		Plates Same – Out Plate Fits 42° 40° & 35° T. Rails Except Drilling In. Plate Fits in 3 1/4" Met
37	PACIFIC AVE.	I	3 1/2" – 5 1/8" – 3 1/2"	1 1/8"	Ditto		5/8" × 3 1/2"	3"	2 3/4"	1 7/8"	1 3/8"	1/4"				17"	Flat 1" in 3/4" Cut		
38	POWELL MARKET 38#	I	3 1/2" – 5 1/8" – 3 1/2"	1 1/8"	Ditto		5/8" × 3 1/2"	3"	2 7/8"	2"	7/8"	3/8"				17"	Flat 1" in 3/4" Cut		
39	SLOT 40#	7																	
40	SLOT 38#	7																	
41	HORSE CAR 40#	P																	
42	HORSE CAR GROOVE 60#	G												B.P. 2601	L.S. Co. 60-215				
43	HORSE CAR CENTER BEARING	6																	
44	7" Z – CAST STEEL	J	See Sketch W		NO BONDS.		7/8" × 2 1/2" C.S. Head	7" Variable	3" Variable	2 1/2" Variable		5/8" Var.	Prmt № 494 Cross 481 Plain	PRINT 449	L.S. Co. SPECIAL	16" Plain – 22"	5/8" Flat C.S. Comb.		Used on L.S. Cast Steel Cable Slot Rail
45	CASTRO HOUSE RAIL	–																	Used in Castro Street Curve
46	EASTON RAIL CAL. ST.	I	4" – 5" – 4"	1 1/4"	NO BOND HOLES		3/4" × 3 3/4"	3 1/2"	4"	2 3/16"		3/8"			L.S. Co. 55-421	18"	1 1/8" Flat		Inside Plate same as 4" Trilby
47																			

REVISIONS

FIGURE 2.6.a (cont.)



No.	Number	Kind of Rail	Outline of Rail	Distance Between Bolt Holes in Plates	Height of Bolt Holes Above Rail Base	Bond Drilling	Size of Bolts	Height of Rail	Width of Rail Base	Width of Rail Ball	Width of Flange for Guard from Gage Line	Thickness of Rail Web	Drawing No. for Rail Drilling	Drawing No. for Rail Section	Catalogue No. for Rail	Length of Plate	Kind of Plate	Cat. No. of Plate Section	Remarks
48	8"-75#		SEE SKETCH "H"		SEE SKETCH "H"	7/8"×3¼"	8"	5½"	2¼"		13/32"					24"	1/16" Spire Fish Plate		In Brie Plate Fits Except Drilling Oct. 58# Greene M. Fits
49	6"-60#		SEE SKETCH "K" 4"-4"-5"-4"	2¾"	SEE SKETCH "K"	1"×3½"	6"	4⅞"	2¼"		3/8"					26"	3/4" Flat 1/2" Rolled		Plate Fits Inbound 85# Greene Except Drilling
50	75# A.S.C.E. STD.		SKETCH "N" & "O" 6"-5"-5"-6"-30° Plate 5"-5"-5"-5"-20° Plate	2⅛"	SEE SKETCH "N" SEE SKETCH "O"	7/8"×4½"	4 13/16"	4 13/16"	2½"		9/16"	117-4 526-0		P.S.Co. 214	6 Hole-30° 4 Hole-20°	Angle	P.S.Co. 214	30° Pl. & Drilling Standard - Same as San Mateo 75# Except Drilling
51	75# A.S.C.E. SAN MATEO		SEE SKETCH "P" 4½"-5"-7"-5"-4½"	2 3/16"	SEE SKETCH "P"	7/8"×4½"	4 13/16"	4 13/16"	2½"		9/16"	839-5		P.S.Co. 214	30°	Angle	P.S.Co. 214	Same Plate & Drilling for San Mateo 70#-72#-75# Rails only Use these plates on San Mateo Line only
52	72# SAN MATEO		SEE SKETCH "P" 4½"-5"-7"-5"-4½"	2 3/16"	SEE SKETCH "P"	7/8"×4½"	4¾"	4¾"	2 7/16"		9/16"	839-5			30"	Angle	P.S.Co. 212	
53	70# ASCE-SAN MATEO 70# ASCE PARKSIDE OCEAN SHORE		SEE SKETCH "Q" 4½"-5"-5½"-5 SM 6"-5"-5"-5"-C-Park O. Shore	2 3/16 SM 2 1/16 P.	SEE SKETCH "P" (SEE SKETCH "Q")	7/8"×4½" SM 3/4"×4½" P.S.	4 5/8"	4 5/8"	2 7/16"		9/16"	839-5 S.M.		P.S.Co. 237	30"— 34"—	Angle S.M. Plate 50 Lbs.	P.S.Co. 50 Lbs.	Outbound Skelly Plate Fits except Drilling
54	65# ASCE CLIFF LINE		SEE SKETCH "R" 5"-5"-5"	1 7/8"	SEE SKETCH "R"	3/4"×4"	4 7/16"	4 7/16"	2 3/16"		15/32"	1955-00		P.S.Co. 236	22"	Angle	P.S.Co. 236	
55	62½# P.R.O. (OLD S.P.)		SEE SKETCH "S" 5"-7 3/8"-5"	1¾"	SEE SKETCH "S"	3/4"×4" 5/8"×4½" 3/4"×3½"	4 3/16"	4 3/16"	2 5/16"		1/2"	SK 205			24"	Angle	P.S.Co. 57	Plate Same as Sotro Except Drilling
56	56# SAN MATEO LINE		SEE SKETCH "T" 5"-8"-5"	1¾"	SEE SKETCH "T"	3/4"×4"	4¼"	4¼"	2⅛"		7/16"	572-0		P.S.Co. 7	24"	Angle	P.S.Co. 130	
57	CLEMENT 56#		SEE SKETCH "T" 5"-8"-5"	1¾"	SEE SKETCH "T"	3/4"×4"	4¼"	4 3/16"	2 5/16"		1/2"	1956-00			24"	Angle	P.S.Co. 131	58 & Clement is same size for Plate but Sotro is slightly smaller. Same plate is used for the 3 Rails however
58	SOTRO 56#		SEE SKETCH "T" 5"-8"-5" San Standard OLD 6-6-6 Not to Use	1¾"	SEE SKETCH "T"	3/4"×4"	4¼"	4⅛"	2¼"		1/2"	1956-00			24"	Angle	P.S.Co. 131-57	
59	8th AVE. 60#		SEE SKETCH "T" 5"-8"-5"	2"	SEE SKETCH "T"	3/4"×4"	4¼"	4¼"	2 3/16"		15/32"			P.S.Co. 214?	24"	Angle		
60	45# STEEL		SEE SKETCH "U" 3½"-3½"-3" Standard 5"-6"-5" San Fr. Not Std.	1 5/8"	SEE SKETCH "U"	3/4"×3½"	3 3/4"	3½"	1 15/16"		13/32"	SK 209.		P.S.Co. 266?	16 Square 22" S.S.F.	Angle	P.S.Co. 266	Inside Skelly Plate Fits Except Drilling
61	50# CALLED 45# IRON		SEE SKETCH "V" 4½"-2½"-4½"	1 9/16"	SEE SKETCH "V"	3/4"×3½"	3 5/8"	3 5/8"	2¼"		5/8"				18"	3/4" Flat & Angle		Inside Skelly Plate Fits Except Drilling
62	42#		SEE SKETCH "V" 4½"-4½"-4½" Standard 5"-3½"-5" South Am. Std.	1½"	SEE SKETCH "V"	3/4"×3½"	3 9/16"	3 9/16"	2"		15/32"				18" Std.			
63	35#		SEE SKETCH "V" 4½"-4½"-4½"	1 7/16"	SEE SKETCH "V"	5/8"×3"	3¼"	3"	1 11/16"		7/16"				18"	5/8" Flat		Same Plate & Drilling Oct 3" Nel. Pacific & Market Plate Fits except Drilling
64	40#		SEE SKETCH "V" 4½"-4½"-4½"	1 7/16"	SEE SKETCH "V"	5/8"×3"	3½"	3¼"	1 13/16"		13/32"				18"	5/8" Flat		
65	3¼" T						3¼"	3 1/8"	1 13/16"		7/16"							No used much
66	1⅞" T BABY						1 7/8"	1 5/8"	5/8"		5/32"							
67	1½" T BABY						1 3/4"	1 3/8"	15/16"		1/8"							
68	80# ASCE T RAIL		SEE SKETCH "X"	2 3/16"	SEE SKETCH "X"	7/8"×4½"	5"	5"	2½"		35/64"	SK. No 475		P.S.Co. 251	30" 24"	Angle Cent.	P.S. 251-A Triple	Purchased No use on Micro. Used from Market St. to Sea Cliff
69	50# LOS A. T RAIL		5"-4 7/8"-5"	1 5/8"	7/8" Hole-5" from End 7/8"-11" cen. Bond.	7/8"×3½"	3 15/16"	3 13/16"	2 1/16"		13/32"				24"	Angle		20# Ford-Built in 1919 Stamped-S.P. T.I.E.T. 1-52

"T" RAILS

FIGURE 2.6.a (cont.)

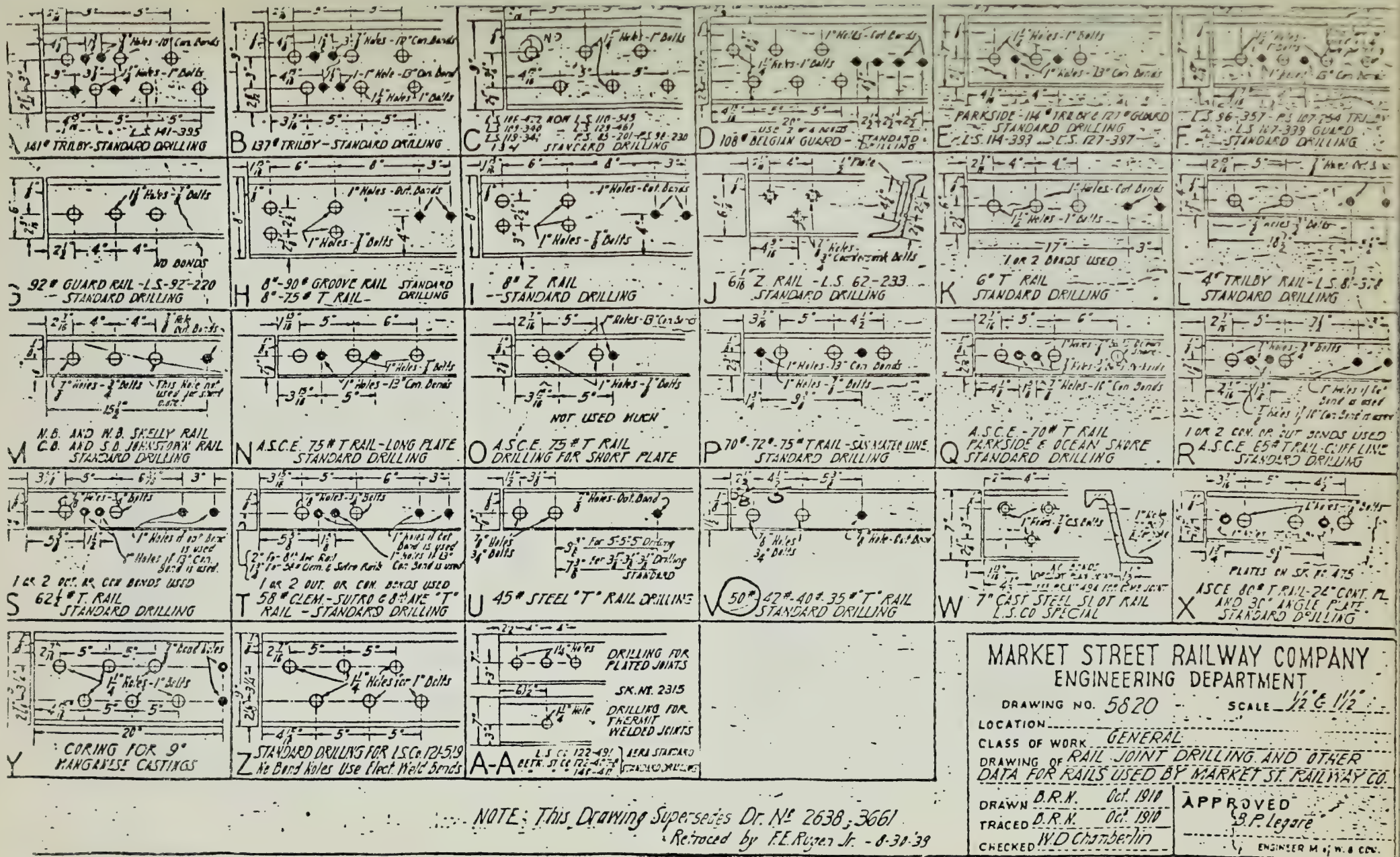
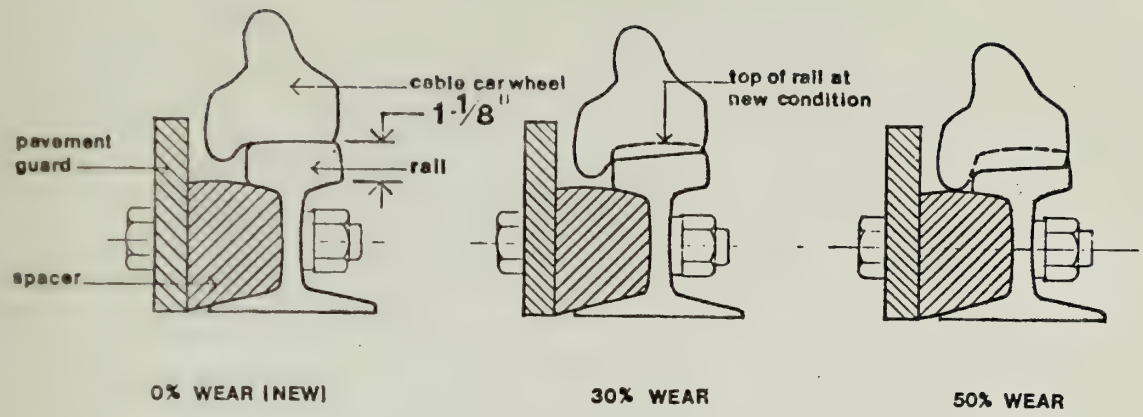
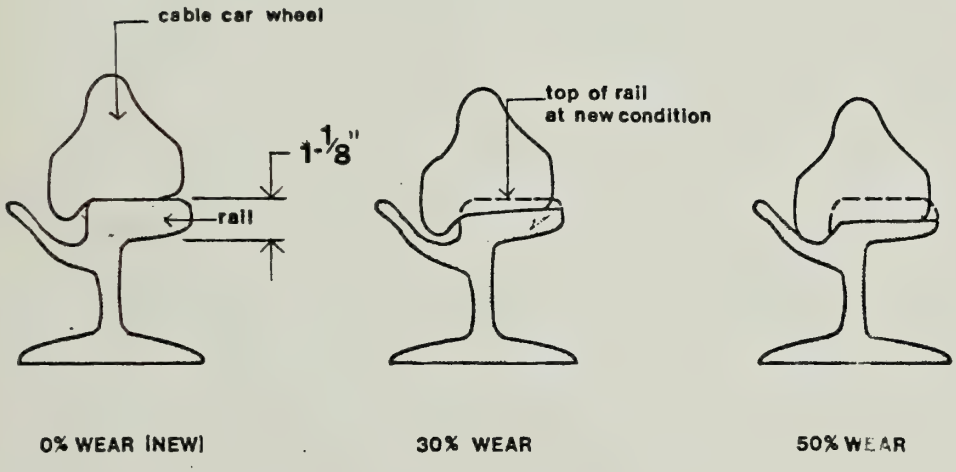

A 141# TRILBY-STANDARD DRILLING
B 137# TRILBY-STANDARD DRILLING
C STANDARD DRILLING
D 108# BELGIAN GUARD-STANDARD DRILLING
E PARKSIDE-114# TRILBY & 127# GUARD STANDARD DRILLING
F STANDARD DRILLING
G 92# GUARD RAIL-L.S.-92-220 STANDARD DRILLING
H 8"-90# GROOVE RAIL 8"-75# T RAIL- STANDARD DRILLING
I 8" Z RAIL -STANDARD DRILLING
J 6 1/16 Z RAIL -L.S. 62-233 STANDARD DRILLING
K 6" T RAIL STANDARD DRILLING
L 4" TRILBY RAIL-L.S. 8-378 STANDARD DRILLING
M N.B. AND N.B. SKELLY RAIL C.B. AND S.B. JOHNSTON RAIL STANDARD DRILLING
N A.S.C.E. 75# T RAIL-LONG PLATE STANDARD DRILLING
O A.S.C.E. 75# T RAIL DRILLING FOR SHORT PLATE
P 70#-72#-75# T RAIL-SUB WATER LINE STANDARD DRILLING
Q A.S.C.E.-70# T RAIL PARKSIDE & OCEAN SHORE STANDARD DRILLING
R A.S.C.E. 65# T RAIL-CLIFF LINE STANDARD DRILLING
S 62 1/2# T. RAIL STANDARD DRILLING
T 58# CLEM-SUTRO & 8# AXE "T" RAIL -STANDARD DRILLING
U 45# STEEL "T" RAIL DRILLING
V 50# 42#-40#-35# "T" RAIL STANDARD DRILLING
W 7" CAST STEEL SLOT RAIL L.S.CO SPECIAL
X A.S.C.E. 80# T RAIL-24" CONT. PL AND 30" ANGLE PLATE STANDARD DRILLING
Y CORING FOR 9" MANGANESE CASTINGS
Z STANDARD DRILLING FOR L.S.Co. 121-519 No Bond Holes Use Elect. Weld Bonds
A-A DRILLING FOR PLATED JOINTS SK. NO. 2315 DRILLING FOR THERMIT WELDED JOINTS
MARKET STREET RAILWAY COMPANY
ENGINEERING DEPARTMENT
DRAWING NO. 5820
SCALE 1/2" = 1 1/2"
LOCATION
CLASS OF WORK GENERAL
DRAWING OF RAIL JOINT DRILLING AND OTHER DATA FOR RAILS USED BY MARKET ST. RAILWAY CO.
DRAWN B.R.N. Oct. 1910
TRACED B.R.N. Oct. 1910
CHECKED W.D Chamberlin
APPROVED B.P. Legare
ENGINEER M. of W. & Eqp.
NOTE: This Drawing Supersedes Dr. No 2638-3661
Retraced by F.E. Rogers Jr. - 8-30-39

FIGURE 2.6.a (cont.)



50 LB. TEE ASCE WEAR PATTERN



55 LB. TRILBY RAIL WEAR PATTERN

FIGURE **2.6.b**

Attachment 2.6.A

CAMPBELL ASSOCIATES, INC.
HEADQUARTERS: SAN FRANCISCO BAY AREA
P.O. BOX 5182
WALNUT CREEK, CALIFORNIA 94596
TELEPHONE: (415) 937-3361

March 20, 1979

Chin & Hensolt Engineers Inc.
182 Second Street
San Francisco, California 94104

CAI P-1024

Subject: Inspection of
Cable Car Trackage
S.F. Muni Railway

Gentlemen:

Your Mr. Cliff Nilan requested that we make surface inspection of the turnouts and special track construction of the cable car trackage and furnish a report of our impressions. This inspection was made on March 15 and 16, partly in company of Mr. Nilan and Mr. Ed Pearlstein.

The inspection included only those portions of the track hardware that are visible from the surface. No measurements of gauge, superelevation, wear, etc., were made. Inspection of the sub-surface hardware was not possible in this brief review, except for occasional glimpses of pulleys, etc. where maintenance crews happened to have hatch covers removed as we passed.

We were given to understand the review was to be part of an effort to determine how many of the existing installations are suitable for perpetuation and how many require replacement.

We were also asked to comment upon any other conditions we observed during our inspection.

Our first impression was that all of the turnouts required some degree of welding and grinding maintenance, and that this work was in an advanced state of deferment.

It appears that the majority of turnouts are in basically sound condition and could be left in service when general track reconditioning takes place. Eight turnouts require only minor, routine welding repairs and seven need heavier welding which would be justified in view of their generally sound condition. Only three turnouts are far enough gone to demand total replacement. Several turnouts in the "heavy repair" category require replacement of parts.

Design of the turnouts on the system is very inconsistent. Some apparently very early turnouts have a very light design that is weak and does not lend itself to replacement of parts. Other turnouts, usually among those in better condition, have more orthodox design, utilizing cast frogs, mates, and switches of ordinary street railway design. Radius of curvature through the

turnouts varies considerably. One in particular has a very broad radius. Others have the entire curve between the point of switch and the slot rail frog. Most are somewhere in between.

It is our recommendation that a standard design be evolved, matching the rail weight that is to become standard for the system, and utilizing cast manganese frogs, switches, and mates. Manganese castings lend themselves favorably to repairing and building up by welding, and can be removed and replaced when necessary with a minimum of field work. Radius of curvature should be as great as track centers and alignment will allow.

We noticed an abundance of cracked welds at slot rail joints all over the system. These welds appeared to be shallow beads applied to the tops of the joints. It is recommended that these cracked joints be exposed enough so that the old welds can be cut out, the ends of the slot rails beveled, and full depth butt welds applied.

We noticed some highly unorthodox welding procedures, such as the application of a continuous bead of weld to build up the gauge corner of the outer rail of a curve. Measures such as these are undoubtedly undertaken in an atmosphere of desparation to keep the system operating; however in some cases, like this one, such measures build more grief into the system than they relieve.

We believe that welding repairs and maintenance can restore many portions of the system to good condition, and can do much to carry the "junk" portions of it until the contemplated renewals are carried out. However, such welding work should be done in a knowledgeable way, using the proper medium (oxy-acetyline versus arc), and in a thorough manner rather than a "quickie" patch-work manner. It is recommended that a welding "unit" be set up, consisting of welder, helper, (and flagman if necessary) and a well-equipped truck, to methodically take care of the necessary work until the large backlog of the work is eliminated. The men should be trained in proper track welding technique, and should be under the direction of a supervisor who closely controls and schedules the work.

We observed a crew renewing frozen curve pulleys and in several instances we checked each carrier pulley over one or two block stretches. Our impression was that a great lack of maintenance exists in this area. Apparently in some places only alternate carrier pulleys remain of those originally in place. Of the remaining ones, many were frozen, some worn almost in two by the cable.

Obviously an awareness of this condition must exist, and we assume that lack of manpower prevents this work from being done. Our thought is that if such lack of maintenance prevails after the system is rebuilt, it will soon deteriorate to an unacceptable level of condition again.

This matter is possibly outside of the area that we are asked to study; however we make the suggestion that the existing crews can come closer to

keeping up with the work if they operate in harmony with an agressive knowledgeable inspector-supervisor who personally inspects the system and controls and schedules the work.

The trackage at Hyde and Washington Streets involves a very cumbersome piece of construction where a gravity track crosses a pull curve. This installation is in very poor condition and should be renewed soon.

We suggest that before the renewal is done, a study be made of the possibilities of eliminating this crossing.

One possibility that comes to mind is that the easterly Hyde Street track be removed from mid-block between Clay and Washington, through the crossing, to and including the turnout between Washington and Jackson. The track would then be connected to the westerly track between Clay and Washington with a new left hand turnout. A new crossover would then be built between the two tracks remaining on Hyde between Washington and Jackson.

California cars returning to the barn would drop the rope north of Clay, switch onto the up-track, and drift down against the travel of the rope (in full release). North of Washington they would use the new crossover to get on the easterly up-track, take the rope, and continue down Washington as at present.

The rail in the street is a mixture of various sections of girder rail, tee rail, and ancient horse car and cable car rails. Condition varies from good to totally worn out. Joints are variously welded or bolted, some in good condition, others in loose, battered, or cracked condition.

Tee rails are used without flangeway liners, a condition that is not conducive to the maintenance of good adjacent pavement.

There is much evidence of patch-work type maintenance, with an abundance of "dutchmen," some as short as three or four feet.

Some sections of track make a fairly good appearance and their reconstruction may be hard to justify. In particular, the trackage on Hyde Street that is traversed by California cars on their way to and from the barn seems to be adequate for its intended purpose.

Rail condition alone is not totally indicative of the need to rebuild a track. Intensive spot-checking of yoke condition should be done, in view of the advanced age of most of them.

The most desirable type of rail for reconstruction would be girder rail, which is unfortunately no longer available. We believe that the 60# ASCE rail which has been chosen as replacement rail is a good second choice. We would recommend that a bar-type flangeway liner (guard rail) be used with this rail in all construction. Thickness of the bar should be not less than 3/4", with

adequately spaced blocks and bolts to prevent deflection under heavy rubber-tired vehicle load. Eventual looseness of parts is the major foe of this type of construction and sturdy initial construction is necessary to prevent it. Firm fastening of the rail to the understructure is necessary to resist the eccentric loading of the rail by road vehicles.

We believe that an alternate to the presently used yoke-and-poured-in-place-concrete construction can be developed, and recommend that this subject receive a thorough study.

Comments on the various turnouts and track components are set forth in the attached listing.

Sincerely,

E. Campbell

ET:cc

Encl.

Comments On Existing Track Components

California & Drumm Sts. - Turnout

Appears fairly solid but guard faces, gauge corners, and flangeways need building up. Shows signs of much previous repairing. Frog intersection badly in need of welding repairs but doesn't appear hazardous. (No flange bearing at frog intersection.) Flangeway of mate badly worn and would be hazardous on leading point turnout movement but OK for trailing point movement. (Presently used for trailing point moves only.)

Turnout can probably be put into acceptable condition by routine repairs.

California & Hyde Sts. - Upper Crossover Turnout

Tongue switch looks good. Flange bearing area of mate needs welding and grinding. Slot frog on main run shows signs of having been broken and welded. Should be reinforced.

Turnout is generally in fair condition and meeds only routine repairs.

California & Hyde Sts. - Lower Crossover Turnout

Turnout has mate and jump mate. (Used for trailing point movements only.) Frog should be welded and ground. Minor welding and grinding should be done elsewhere.

Turnout is generally in fair condition and needs only minor maintenance.

California and Hyde Sts. - East Turnout to Hyde St.

Turnout has slot guide and is combined with a pull curve. Several slot rail joints appear to be loose and should be checked.

Turnout appears to be in fair condition and needs only minor welding and grinding maintenance.

California & Hyde Sts. - West Turnout from Hyde St.

Turnout has mate and jump mate, for trailing point movements. Frog has no flange bearing tread and needs welding repairs.

Turnout is generally in fair condition and needs only routine maintenance.

California & Hyde Sts. - Gravity Curve

Curve shows signs of derailments toward inside of curve. (Curve has guard rail on inner rail only.)

The condition of the curve does not appear to have contributed to the derailments. At the time of the inspection there was an accumulation of gravel in the flangeway of the inner rail at the point where the derailments occurred. It is possible that a larger accumulation could lift the flanges up and allow them to ride over the rail head. Periodic sweeping of the flangeway may help to avoid this problem. Application of a guard rail to the outer rail would be a more positive cure.

California St. & Van Ness Ave. - Turnout

Turnout has spring tongue switch and mate, and spring slot guide. Tongue should be welded for more positive back-of-flange bearing. Gauge corner of tongue should be welded to restore worn area. Mate needs welding and grinding. Slot frogs are worn and need building up by welding. Frog is in poor condition and needs welding. Slot point is about an inch high and vibrates. Should be checked.

Turnout appears to be basically sound but is long overdue for repairs and maintenance. This work should be done soon.

Washington & Hyde Sts. - Pull Curve & Crossing

Rails and guard rail are beyond repair and should be replaced. The crossing which carries the easterly Hyde St. track through the middle of this curve is hopelessly beyond repair. It should be replaced in heavier construction or preferrably eliminated. (See remarks about general track revision in Washington- Hyde area.)

Hyde St. between Washington & Jackson Sts. - Turnout

Turnout is in poor condition. Frog is broken up and probably beyond repair. Joint at heel of frog has failed and requires replacement rail. Slot frogs need welding. Spring tongue switch and mate in fair condition but require welding. Toe joint of mate shows signs of failure.

Turnout should be entirely renewed. (See remarks about general track revision in Washington-Hyde area. These remarks suggest that turnout be changed from left hand to right hand.)

Hyde & Jackson Sts. - Pull Curve

Curve appears fairly sound except that guard rail is worn, permitting flanges to crowd gauge corner of outer rail. Should have new guard rail.

Hyde & Jackson Sts. - Upper Crossover Turnout

Turnout has heavy tongue switch and large radius through turnout. General condition is fair and could be restored to good condition by routine welding maintenance.

Hyde & Jackson Sts. - Lower Crossover Turnout

Complicated turnout account crosses over to far track of 3-rail gauntlet track. Turnout is fairly sound but needs welding and grinding repairs.

Turnout has two mates, and leading point movements are made on the tangent run. Recommend that tongue switch be installed. If an obstruction in the flangeway of one of the mates should cause the wheel to deflect into the diverging route, the grip would follow into the wrong slot and damage to the cable would result.

Filbert & Hyde Sts. - Lower Crossover Turnout

Turnout out of service. Mate and jump mate appear sound. Frog has piece of rail head broken out and requires replacement rail.

Unused flangeways and slots are welded shut. Turnout could be restored to use by making necessary repairs.

It appears that this crossover would be useful for towing bad-order out-bound cars to the barn without having to negotiate the Hyde St. hill, and it is suggested that its return to service be studied.

Filbert & Hyde Sts. - Upper Crossover Turnout

Turnout out of service. Switch and mate have been removed and unused flangeways are welded shut. One slot frog needs repairs.

Extensive work would be necessary to restore turnout to usable condition.

(Note) If the above two turnouts are not to be restored to service, they should be removed.

Hyde & Beach Sts. - Pull Curve

Recent construction. Broad radius. Good condition.

Hyde & Beach Sts. - Gravity Curve

Recent construction. Good condition. Rails beginning to show corrugation.

Jackson St. between Mason & Taylor Sts. - Turnout

Carbarn inbound turnout. Has heavy switch and mate, and insert frog. Switch body has been much welded and has a crack, but is generally sound. Tongue is much welded but OK.

Installation appears to be very old, judging from cobblestone pavement in turnout area, but appears to be in satisfactory condition.

Washington St. between Mason & Taylor Sts. - Turnout

Carbarn outbound turnout. Has mate and jump mate. Frog badly broken up. One slot frog broken on main running rail.

Turnout is generally in bad shape. Can be helped by welding but should be replaced.

Washington & Mason Sts. - Turnout

Heavy construction. Two mates. Approach curve in good condition. Turnout in good condition except for minor welding requirements on mate flangeways.

Washington St. between Powell & Mason Sts. - Crossover

Crossover from one side of 3-rail gauntlet to other side. Upper turnout has heavy switch and mate; lower turnout has two heavy mates. All are badly worn. Crossover could be restored to reasonable condition by welding and grinding.

Mason St. between Washington & Jackson Sts. - Turnout

Unused turnout in poor condition. Should be removed.

Mason & Jackson Sts. - Crossing

Good condition.

Mason & Jackson Sts. Pull Curve

Pull curve appears to be in good condition. East end of curve has center-rail frog where curve deflects from 3-rail gauntlet track. Frog needs welding build-up. Approaching center rail in bad condition.

Frog should be renewed when approaching track is rebuilt.

Powell St. between Washington & Jackson Sts. - Turnout

Turnout diverges single track to 3-rail gauntlet track. Heavy switch and mate. Both need welding. Tongue is depressed and does not offer proper guidance to back of flange. Slot frogs need building up. Center rail frog needs building up.

Turnout can be put into acceptable condition by welding repairs.

Powell & Washington Sts. - Turnout

Turnout has mate, jump mate, and jump frog. All need welding and can be helped out to a more acceptable condition, but the general condition is so poor that the turnout should be replaced.

Powell & Washington Sts. - Gravity Curve

Upper end of curve comes off 3-rail gauntlet track. Center rail frog is badly worn and should have welding repairs.

Powell & Washington Sts. - Pull Curve

Rails and guard rail badly worn and loose. Slot rails have broken joints.

Curve should be entirely reworked.

Section 2.7

PAVEMENT

2.7.1 Description

Pavement materials used in the right of way include interspersed sections of asphaltic concrete, concrete, brick, and cobblestones. Most is asphaltic concrete, except on the California line from Montgomery St to Van Ness Av, where most is concrete.

2.7.2 Inspection

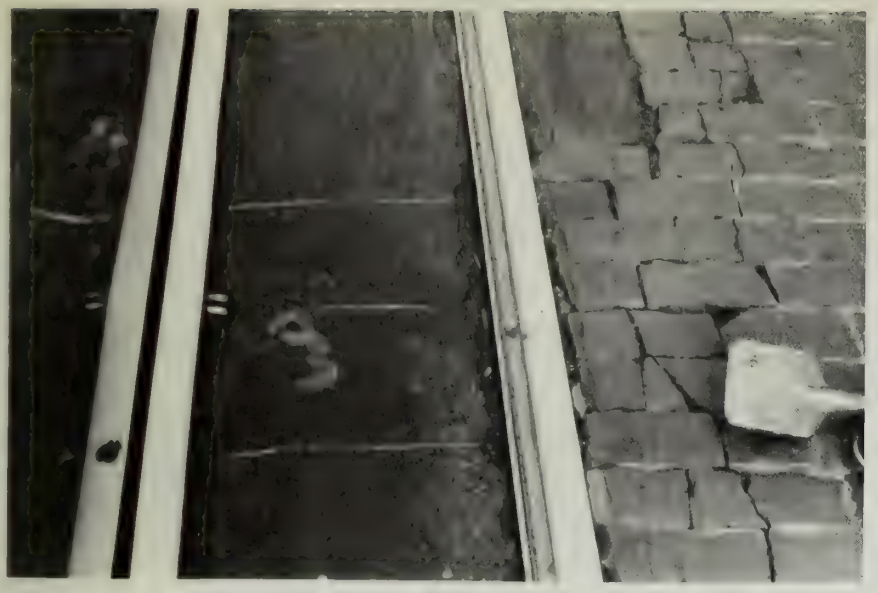
Of 1695 locations inspected, 419 were in good condition -- no cracks or holes; 521 were in fair condition -- small cracks and surface sunk in relation to top of rail; and 755 were in poor condition -- large cracks or holes along side of running rail and/or slot rail and/or hatch frames.

2.7.3 Evaluation

Pavement failures are due to (1) cable car derailment (derailed cars sometimes run a block or more before resuming the track), with resulting deterioration and gouging, which is particularly unsightly in the brick-paved areas at Hallidie Plaza and the Powell St mall; (2) structural failure of pavement plates and hatch frames, leading to lack of support of local pavement, with the result that it collapses at that point into the conduit channel; and/or (3) loose rail joints, which allows rail to move vertically, damaging

adjacent pavement. The practice of filling holes in pavement plate with rags and other improvised material leads to premature pavement failure.

Illustrations



Broken bricks caused by movement of rail (Powell near Geary).

Pitted, gouged, and cracked pavement (Washington to Powell drift curve).

Disintegrated pavement due to loose rail (Jackson near Powell).

Section 2.8

Pull Curves

The system's 12 pull curves are Powell St to Jackson St (two -- Powell-Mason line and Hyde line), Jackson St to Mason St, Mason St to Columbus Av, Columbus Av to Taylor St, Taylor St to Columbus Av, Columbus Av to Mason St, Jackson St to Hyde St, Victorian Park to Hyde St, Hyde St to Washington St, Washington St to Powell St, and California St to Hyde St.

2.8.1 Description

Compound curves. Running rail -- 50-lb or 100 lb Tee, with 5/8 x 4-1/2 in. mild steel flat-bar guards. Slot rail -- 40-lb pulleys -- cast steel ASTM A148 class 120-95, 250-280 BHN, 18-1/2 in. diameter (width 3-3/4 or 7 in.), with brass or antifriction bearings. Chafing bar -- mild steel, 1 x 3 in.

2.8.2 Inspection

Condition criteria

- Running rail 50-lb Tee: same as in Section 2.6.
- Running rail 100-lb Tee: good -- head 3/4 in. deep; fair -- head less than 3/4 in. deep; poor -- head less than 1/2 in. deep and/or loose rail.

- Guards: good -- securely fastened to running rail at separators, joints securely welded, more than 9/16 in. thick at top; fair -- securely fastened to running rail, joints securely welded, more than 3/16 in. thick at top; poor -- loosely fastened to running rail, joints insecurely welded and forming butt joint, less than 7/16 in. thick at top.

- Pulley: diameter to cable groove, 15-1/2 in.; good -- 15 in.; fair -- 14-1/2 in.; poor -- 14 in. or slowed or stopped; destruction, 13-1/2 in.

- Pulley bearing: good -- holds pulley at centerline; fair -- holds pulley near centerline; poor -- does not allow pulley to rotate due to excessive wear.

- Pulley frame: good -- upper and lower plates securely fastened to end, no missing bolts at bearing mounts, only 1/16 in. play at mounting-pin holes; fair -- plates securely fastened, no missing bolts, 3/16 in. play; poor -- loose or missing bolts and more than 3/16 in. play.

- Chafing bar: good -- little wear by grip and at least 7/8 in. thick at centerline; fair --

some wear by grip and 3/4 in. thick at centerline; poor -- considerable wear by grip and less than 3/4 in. thick at centerline.

Inspection results (by curve)

- Powell to Jackson -- Powell-Mason line (32 inspection locations); see Figure 2.8.a
  Outside rail -- 32 poor; inside rail -- 32 good; outside guard -- 32 poor; inside guard -- 32 poor; slot rail -- 32 poor; pulleys -- 22 good, 4 fair, 6 poor; bearings -- 15 good, 2 fair, 15 poor; frames -- 29 good, 1 fair, 2 poor; chafing bar -- 32 fair.

- Powell to Jackson -- Hyde line (29 inspection locations; see Figure 2.8 .a
  Outside rail -- 29 good; inside rail -- 29 poor; outside guard -- 29 poor; inside guard -- 29 poor; slot rail -- 29 poor, pulleys -- 22 good, 5 fair, 2 poor; bearings -- 12 good, 1 fair, 16 poor; frames -- 26 good, 3 poor; chafing bar -- 29 fair.

- Jackson to Mason (32 inspection locations); see Figure 2.8.b
  Outside rail -- 2 fair, 30 poor; inside rail -- 32 poor; outside guard (29 inspection loca-

tions) -- 29 poor; inside guard -- 32 poor; slot rail -- 32 poor; pulleys -- 12 good, 13 fair, 5 poor, 2 no stations; bearings -- 13 good, 6 fair, 11 poor; frames -- 19 good, 2 fair, 9 poor; chafing bar -- 2 fair, 30 poor.

- Mason to Columbus (48 inspection locations); see figure 2.8.c
  Outside rail -- 32 good, 7 fair, 9 poor; inside rail -- 18 good, 30 fair, outside guard (16 good, inside guard -- 46 good, 2 fair, slot rail -- 37 good, 11 fair, pulleys -- 8 good, 7 fair, 33 poor (24 missing); bearing (24 pulleys) -- 9 good, 1 fair, 14 poor; frames (24 pulleys) -- 14 good, 6 fair, 4 poor; chafing bar -- 48 fair.

- Columbus to Taylor (12 inspection locations); see Figure 2.8 .d
  Outside rail -- 12 good; inside rail -- 12 good; outside guard -- none; inside guard -- 8 good, 4 fair, slot rail -- 11 good, 1 poor; pulleys -- 5 good, 4 fair, 3 poor; bearings -- 5 good, 1 fair, 6 poor; frames -- 9 good, 1 fair, 2 poor; chafing bar -- 12 fair.

- Taylor to Columbus (18 inspection location); see Figure 2.8.d

  Outside rail -- 18 good; inside rail -- 18 good; outside guard (3 inspection locations) -- 3 good: inside guard -- 18 good; slot rail -- 18 good; pulleys -- 11 good, 2 fair, 4 poor, 1 no station; bearings (17) pulleys) -- 6 good, 6 fair, 5 poor; frames (17 pulleys) 13 good, 4 poor; chafing bar -- 18 fair.

- Columbus to Mason (45 inspection locations); see Figure 2.8.c

  Outside rail -- 10 good, 17 fair, 18 poor; inside rail -- 42 good, 2 fair, 1 poor; outside guard (13 inspection locations) -- 13 good; inside guard -- 33 good, 7 fair, 5 poor; slot rail -- 29 good, 13 fair, 3 poor; pulleys -- 14 good, 4 fair, 27 poor, (20 missing); bearings (25 pulleys) -- 9 good, 2 fair, 14 poor; frames (25 pulleys) -- 18 good, 2 fair, 5 poor; chafing bar -- 45 fair.

- Jackson to Hyde (23 inspection locations) see Figure 2.8.e

  Outside rail -- 22 fair, 1 poor; inside rail -- 23 fair, outside guard -- none; inside guard -- 23 poor; slot rail - 23 good; pulleys -- 11 good,

9 fair, 3 poor, (1 missing); bearings (22 pulleys) -- 11 good, 4 fair, 7 poor; frames (22 pulleys) -- 19 good, 2 fair, 1 poor; chafing bar -- 23 good.

- Victorian Park to Hyde (32 inspection locations); see Figure 2.8.g
  Outside rail -- 32 good; inside rail -- 32 good; outside guard -- none; inside guard -- 18 fair, 14 poor; slot rail -- 32 good; pulleys -- 25 good, 4 fair, 3 poor; bearings -- 13 good, 7 fair, 12 poor; frames -- 29 good, 3 poor, chafing bar -- 30 fair.

- Hyde to Washington (36 inspection locations) see Figure 2.8.f
  Outside rail -- 9 good, 14 fair, 13 poor; inside rail -- 36 good; outside guard (10 inspection locations) -- 1 good, 4 fair, 5 poor; inside guard -- 6 good, 3 fair, 27 poor; slot rail -- 36 good; pulleys -- 23 good, 10 fair, 3 poor; bearings -- 15 good, 9 fair, 12 poor; frames -- 33 good, 1 fair, 2 poor; chafing bar -- 7 good, 29 fair.

- Washington to Powell (29 inspection locations); see Figure 2.8.h
  Outside rail -- 29 poor; inside rail -- 29 poor: outside guard -- 29 poor; inside guard -- 29 poor; slot rail -- 29 poor; pulleys -- 12 good, 7 fair, 10 poor; bearings -- 10 good, 4 fair, 15 poor; frames -- 25 good, 2 fair, 2 poor; chafing -- 29 fair.

- California to Hyde (32 inspection locations); see Figure 2.8.i
  Outside rail -- 32 good; inside rail -- 32 good; outside guard (5 inspection locations) -- 4 good, 1 poor; inside guard (30 inspection locations) -- 3 good, 27 fair; slot rail (31 inspection locations) -- 31 good; pulleys -- 12 good, 12 fair, 8 poor, (2 missing); bearings (30 pulleys) -- 8 good, 3 fair, 19 poor; frames (30 pulleys) -- 26 good, 2 fair, 2 poor; chafing bar -- 32 good.

Inspection results (by component; 348 locations)

- Outside rail -- 174 good, 62 fair, 132 poor.
- Inside rail -- 222 good, 55 fair, 91 poor.
- Outside guard (166 inspection locations) -- 37 good, 4 fair, 125 poor.

- Inside guard (366 inspection locations) -- 114 good, 61 fair, 191 poor.
- Slot rail (367 inspection locations) -- 217 good, 24 fair, 126 poor.
- Pulleys - 177 good, 81 fair, 107 poor (47 missing), 3 no stations.
- Bearings (318 pulleys) -- 126 good, 46 fair, 146 poor.
- Frames (318 pulleys) -- 260 good, 19 fair, 39 poor.
- Chafing bar -- 62 good, 274 fair, 32 poor.

2.8.3 Evaluation

The difficulty in lifting hatch covers that weight 125 to 235 lbs discourages inspection and maintenance, and inadequate maintenance is primarily responsible for the fact that at 174 of the 365 designated pulley stations inspected the pulleys were malfunctioning, stopped, or missing. Following is the record of the last maintenance performed on the 174 pulleys before the Chin & Hensolt inspection (maintenance data was collected from entries on cards kept in the cable machinery supervisor's office).

Chart 1

MALFUNCTIONING PULL CURVE PULLEYS:
LAST SERVICE BEFORE C & H INSPECTION

Match	Chain & Hensolt Inspection		Last Service		Days Since Last Service
	Date	Malfunction	Date	Service Performed	
MA-CO					
5	1/22/79	Pulley Missing	4/19/77	Serviced	642
9	1/22/79	Pulley Stopped	12/12/78	Changed Pulley	41
11	1/22/79	Pulley Stopped	8/24/78	Changed Pulley	151
13	1/22/79	Pulley Missing	4/19/77	Serviced	277
15	1/22/79	Pulley Stopped	12/12/78	Changed Pulley	41
17	1/22/79	Pulley Missing	4/19/77	Serviced	642
19	1/22/79	Bearings Dry	8/12/77	Changed Pulley	162
21	1/22/79	Pulley Missing	4/19/77	Serviced	642
25	1/22/79	Pulley Missing	12/12/78	Changed Pulley	41
29	1/22/79	Pulley Missing	4/19/77	Serviced	642
33	1/22/79	Pulley Missing	4/19/77	Serviced	642
35	1/22/79	Pulley Stopped	12/13/78	Changed Pulley	40
37	1/22/79	Pulley Missing	4/19/77	Serviced	642
39	1/22/79	Pulley Missing	4/19/77	Serviced	642
41	1/22/79	Pulley Stopped	10/5/78	Changed Pulley	79
43	1/22/79	Pulley Missing	4/19/77	Serviced	642
51	1/22/79	Pulley Missing	4/19/77	Serviced	642
55	1/26/79	Pulley Missing	4/14/77	Serviced	643
57	1/26/79	Bearings B.O.	4/19/77	Serviced	638
59	1/26/79	Pulley MIssing	4/19/77	Serviced	638
61	1/26/79	Pulley MIssing	4/19/77	Serviced	638
63	1/26/79	Pulley Stopped	4/19/77	Serviced	638
65	1/26/79	Pulley Missing	4/19/77	Serviced	638
67	1/26/79	Bearings B.O.	4/19/77	Serviced	638
69	1/26/79	Pulley Missing	4/19/77	Serviced	638
73	1/26/79	Pulley Missing	4/19/77	No Record	638
75	1/26/79	Pulley Missing	4/19/77	No Record	638
77	1/26/79	Pulley Stopped	6/12/78	Started	257
79	1/26/79	Pulley Missing	6/12/78	No Record	257
83	1/26/79	Pulley Stopped	11/16/78	Changed Pulley	71
85	1/26/79	Pulley Missing	11/16/78	No Record	71
87	1/26/79	Bearings B.O.	11/16/78	No Record	71
89	1/26/79	Bearings B.O.	12/5/77	Start	52
2	1/26/79	Pulley Missing	12/5/77	Pulley Missing	52
6	1/26/79	Pulley Stopped	9/1/78	Changed Pulley	147
10	1/26/79	Pulley Missing	9/1/78	No Record	147
18	1/26/79	Pulley Missing	5/17/78	Changed Pulley	285
22	1/26/79	Pulley MIssing	5/17/78	No Record	285
24	1/29/79	Pulley Missing	1/30/78	Greased	30
26	1/29/79	Bearings Dry	12/13/78	New Pin	47
30	1/29/79	Pulley Missing	12/13/78	No Record	47
32	1/29/79	Bearings B.O.	1/23/78	Greased + Start	10
34	1/29/79	Pulley Missing	1/23/78	No Record	10
36	1/29/79	Bearings Dry	1/4/79	Changed Pulley	25
38	1/29/79	Pulley Missing	1/4/79	No Record	25
40	1/29/79	Pulley Stopped	1/4/79	No Record	25
42	1/29/79	Pulley Missing	1/4/79	No Record	25
44	2/2/79	Pulley Stopped	1/4/79	Changed Pulley	56
46	2/2/79	Pulley Missing	1/4/79	No Record	56
48	2/2/79	Pulley Missing	1/4/79	No Record	56
50	2/1/79	Bearings B.O.	1/9/79	Started	22
52	2/1/79	Pulley Stopped	1/31/78	Started	1
54	2/1/79	Pulley Missing	1/31/78	No Record	1
56	2/1/79	Pulley Missing	8/23/78	Changed Pulley	162
60	2/1/79	Pulley Missing	8/23/78	Changed Pulley	162
64	2/1/79	Pulley Missing	8/23/78	No Record	162
66	2/1/79	Bearings B.O.	5/9/78	Changed Pulley	267
68	2/1/79	Pulley Missing	5/9/78	No Record	267
70	2/1/79	Pulley Missing	5/9/78	No Record	267
72	2/1/79	Pulley Stopped	11/21/78	Changed Pulley	72
74	2/1/79	Pulley Missing	11/21/78	No Record	72
76	2/1/79	Pulley Stopped	11/21/78	No Record	72
78	2/1/79	Pulley Missing	11/21/78	No Record	72
80	2/1/79	Pulley Stopped	12/13/78	Changed Pulley	50

Chart 1 (cont)

Hatch	Chin & Hensolt Inspection		Last Service		Days Since Last Service
	Date	Malfunction	Date	Service Performed	
MA-CO					
82	2/1/79	Pulley Missing	12/13/78	No Record	50
84	2/1/79	Pulley Missing	12/13/78	No Record	50
86	2/1/79	Pulley Stopped	12/13/78	No Record	50
88	2/1/79	Pulley Missing	12/13/78	Pulley Missing	50
90	2/1/79	Pulley Missing	12/13/78	Pulley Missing	50
92	2/1/79	Pulley Stopped	10/6/78	Changed Pulley	118
94	2/1/79	Pulley Missing	10/6/78	No Record	118
CO-TA					
1	12/15/78	Bearings B.O.	8/30/78	Changed Pulley	106
7	12/15/78	Bearings B.O.	6/22/77	Changed Pulley	170
19	12/12/78	Pulley Stopped	12/4/78	Changed Pulley	8
23	12/12/78	Pulley Frame Brkn	8/15/78	Greased	118
25	12/12/78	Pulley Frame Brkn	8/15/78	Changed Pulley	119
29	12/12/78	Shaft Stopped; Pulley Turning	8/16/77	Changed Pulley	118
31	3/1/79	Bearings B.O.	4/23/78	Changed Pulley	310
2	1/29/79	Pulley Stopped	7/26/78	Changed Pulley	186
4	1/29/79	Bearings B.O.	7/26/78	Changed Pulley	186
6	1/29/79	Bearing Bolts Missing	10/25/78	Changed Pulley	96
14	1/29/79	Pulley Stopped	8/18/78	Changed Pulley	114
20	1/29/79	Bearings B.O.	12/2/77	Greased	58
22	1/29/79	Bottom Bearing BO	4/11/78	Changed Pulley	294
24	1/29/79	Bearings B.O.	12/4/78	Greased	56
PO-JA					
3	1/29/79	Bearings B.O.	12/12/77	Greased + Start	48
9	3/5/79	Bearings B.O.	6/2/78	Changed Pulley	276
11	3/5/79	Bearings B.O.	8/26/77	Greased	191
15	3/5/79	Bottom Bearing BO	2/22/78	Changed Pulley	376
19	3/5/79	Bearings B.O.	5/10/78	Changed Pulley	299
27	3/5/79	Bottom Bearing BO	1/21/78	Changed Pulley	380
29	3/5/79	Bearing B .O.	6/13/77	Changed Pulley	265
31	1/12/79	Pulley Stopped	7/20/78	Changed Pulley	176
35	1/12/79	Pulley Stopped	3/13/78	Greased	305
41	1/12/79	Bearings B.O.	12/13/77	Changed Pulley	395
43	1/12/79	Pulley Stopped	4/10/78	Changed Pulley	277
45	1/12/79	Pulley Dragging	12/19/77	Changed Pulley	389
51	1/12/79	Top Bearing B.O.	5/18/78	Changed Pulley	239
55	1/12/79	Bottom Bearing BO	5/9/78	Changed Pulley	230
57	1/12/79	Bearings B.O.	6/9/77	Cleaned	260
8	1/12/79	Bearings B.O.	12/8/77	Start	400
28	1/17/79	Bearings B.O.	6/20/78	Changed Pulley	211
34	1/17/79	Bottom Bearing BO	5/17/78	Greased	245
44	1/12/79	Bearings B.O.	10/6/78	Changed Pulley	79
52	1/12/79	Bearings B.O.	8/9/78	Changed Pulley	156
54	1/12/79	Bearings B.O.	5/17/78	Greased	150
60	2/6/79	Bearings B.O.	8/9/78	Changed Pulley	181
64	2/6/79	Bearings B.O.	4/10/78	Changed Pulley	261
JA-MA					
9	2/6/79	Bearings B.O.	11/27/78	Changed Pulley	71
12	11/29/78	Bearings B.O.	11/8/78	Changed Pulley	21
13	11/28/78	Bearings B.O.	7/26/78	Changed Pulley	95
14	11/28/78	Bearings B.O.	5/12/78	Changed Pulley	200
15	12/15/78	Bearings B.O.	10/6/78	Changed Pulley	70
27	11/28/78	Frame Broken	8/28/78	Changed Pulley	91
JA-HY					
2	12/7/78	Bearings B.O.	3/28/78	Greased + Started	254
3	12/7/78	Bearings B.O.	11/24/78	Greased + Start	13
6	12/7/78	Pulley Missing	11/24/78	No Record	13
7	12/7/78	Bearings Dry	11/8/78	Changed Pulley	29
8	12/7/78	Bearings B.O.	6/27/78	Changed Pulley	163
12	12/7/78	Bearings B.O.	6/27/78	No Record	163
17	12/13/78	Pulley Stopped	11/8/78	Changed Pulley	35
18	12/13/78	Bottom Bearing Dr	1/22/79	Changed Pulley	22
22	12/13/78	Bearings B.O.	8/4/78	Changed Pulley	131
23	12/13/78	Bottom Bearing Dr	12/13/78	Changed Pulley	

Chart 1 (cont)

Hatch	Chin & Hensolt Inspection		Last Service		Days Since Last Service
	Date	Malfunction	Date	Service Performed	
BE-HY					
3	1/22/79	Pulley Stopped	3/2/78	Changed Pulley	35
6	1/22/79	Pulley Stopped	9/12/77	Inspected + Greased	171
9	1/22/79	Pulley Stopped	11/1/77	Changed Pulley	82
23	1/22/79	Bearings B.O.	11/1/77	Changed Pulley	82
24	1/22/79	Pulley Stopped	11/1/77	Serviced	82
25	3/1/79	Bearings B.O.	1/22/78	Changed Pulley	100
28	3/1/79	Bearings B.O.	5/30/78	Start	274
32	3/1/79	Bearings B.O.	9/15/77	Inspected + Greased	167
HY-WA					
1	3/1/79	Bottom Bearing B.O.	12/21/78	Changed Pulley	64
2	3/1/79	Bearings B.O.	9/20/77	Greased	496
17	1/22/79	Bearings B.O.	4/3/78	Changed Pulley	293
21	1/22/79	Bearings B.O.	9/20/77	Greased	458
23	1/22/79	Top Bearing B.O.	9/20/77	Changed Pulley	458
26	1/22/79	Bearings B.O.	12/12/79	Tighten Bracket	41
WA-PO					
1	1/22/79	Bearings Dry	11/8/78	Changed Pulley	75
2	1/22/79	Bearings Dry	11/8/78	Changed Pulley	75
4	1/22/79	Bearings B.O.	11/17/77	Changed Pulley	66
5	1/10/79	Bearings B.O.	2/13/78	Start	330
9	1/24/79	Pulley Stopped	10/24/79	Inspected	91
12	1/22/79	Bearings B.O.	8/22/78	Changed Pulley	153
14	1/25/79	Bearings B.O.	8/10/78	Changed Pulley	168
15	1/25/79	Bearings B.O.	8/1/78	Greased + Start	177
16	1/25/79	Bearings B.O.+ Pulley Flat	7/26/78	Changed Pulley	183
17	1/24/79	Bearings B.O.	8/22/78	Changed Pulley	156
19	2/15/79	Bearings B.O.+ Pulley Flat	10/20/78	Greased + Start	118
20	12/22/78	Bearings B.O.	6/26/78	Changed Pulley	178
21	1/22/79	Bearings B.O.	12/9/77	Changed Pulley	44
23	1/25/79	Pulley Stopped	3/22/78	Changed Pulley	309
24	1/10/79	Bearings B.O.	10/20/78	Changed Pulley	82
29	1/10/79	Pulley Stopped	11/21/78	Greased	52
CA-HY					
1	12/22/78	Pulley MIssing	5/23/77	Cleaned	577
2	12/22/78	Bearings B.O. + Pulley Flat	5/23/78	Cleaned	577
3	12/22/78	Pulley Missing	1/13/78	Changed Pulley + Cleaned	40
4	12/22/78	Pulley Stopped	4/19/77	Changed Pulley	611
CA-HY (cont)					
5	12/22/78	Pulley Stopped	12/22/78	Cleaned + Greased	
6	12/22/78	Pulley Stopped	10/18/78	Started	65
10	12/22/78	Bearings B.O.	4/19/77	Serviced	612
12	12/22/78	Pulley Stopped	4/19/77	Started	612
13	12/22/78	Bearings B.O.	4/19/77	Serviced	612
14	12/22/78	Bearings B.O.	4/19/77	Serviced	612
17	12/22/78	Bearings B.O.	4/19/77	Serviced	612
18	12/22/78	Bearings B.O.	4/19/77	Serviced	612
19	12/22/78	Bearings B.O.	4/19/77	Serviced	612
22	12/22/78	Bearings B.O.	2/10/78	Cleaned	315
24	12/20/78	Pulley Stopped	4/19/77	Serviced	496
25	1/24/79	Bearings B.O.	12/1/77	Cleaned + Greased	419
26	1/24/79	Bearings B.O.	11/2/78	Changed Pulley	83
28	1/24/79	Bearings B.O.	8/23/78	Changed Pulley	154
29	1/24/79	Bearings B.O.	8/23/78	No Record	154
31	1/24/79	Bearings B.O.	8/23/78	No Record	154

The flat face of the curve pulley tends to distort the cable into an oval shape. Since the radial load of the cable on each pulley is about 1250 lb and at each pull curve the load is imposed about 30 times at the rate of three times a second, the effect is to hammer the rope with a 1200 lb load. The energy expended in thus compressing the cable is not recovered, and this accounts partly for the disparity between the energy required to bend the cable around a 90° pull curve and the energy required to turn it 90° around a bend sheave. The pull curve adds about six percent to the tension force required to move the cable, whereas the bend adds about one and one-half percent. The tension force added by the pull curve becomes even greater when pulleys are malfunctioning.

Cracks observed in chafing bars at 71 inspection locations are due to weakening of the metal by the countersunk bolts and welding used for attaching the bar to angle brackets.

Figures

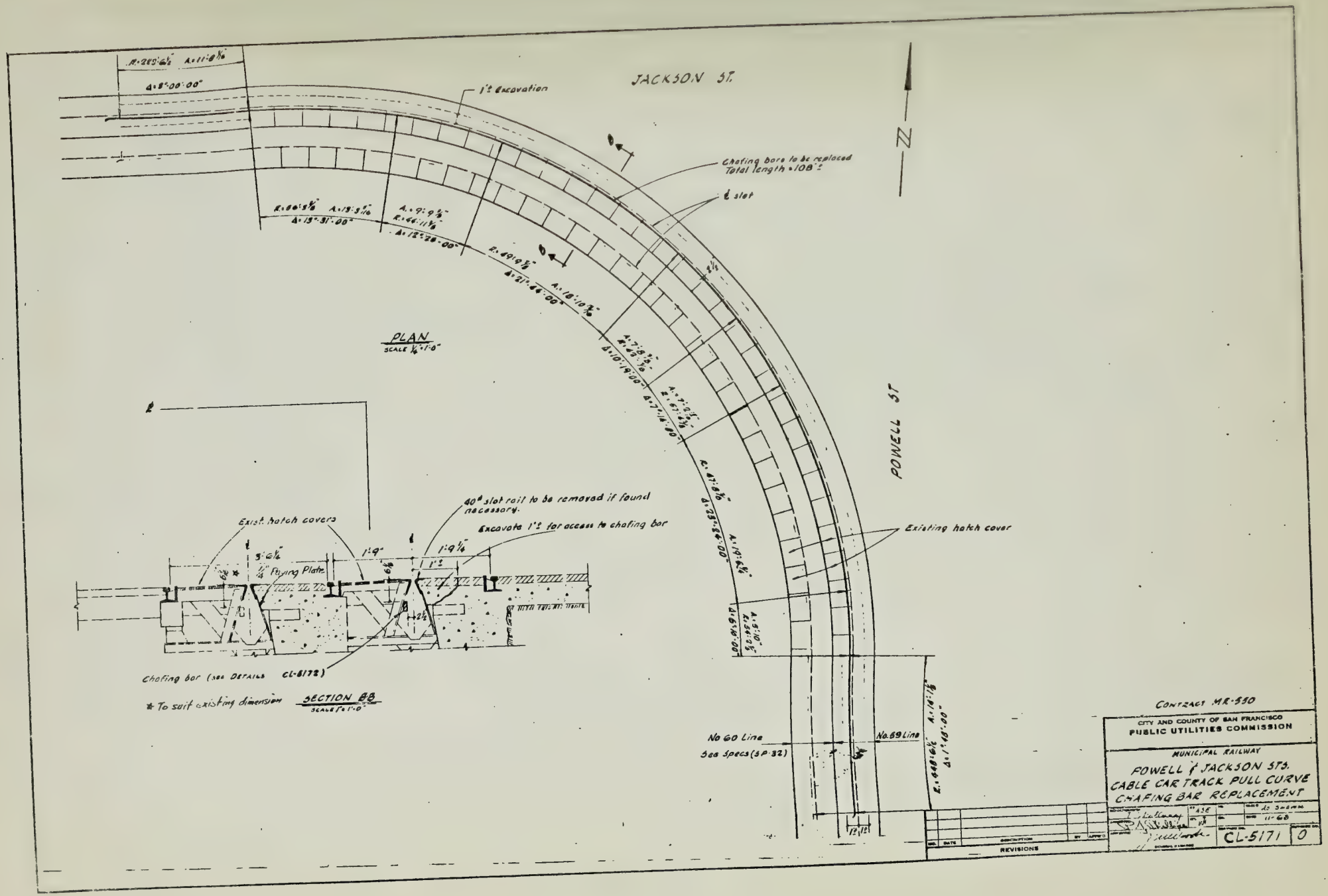

JACKSON ST.
POWELL ST
PLAN
SCALE 1/8"=1'-0"
1'± Excavation
Chafing bars to be replaced
Total length =108'±
℄ slot
Existing hatch cover
40# slot rail to be removed if found necessary.
Excavate 1'± for access to chafing bar
Exist. hatch covers
1/4" Plying Plate
Chafing bar (see Details CL-5172)
* To suit existing dimension
SECTION BB
SCALE 1"=1'-0"
No 60 Line
See Specs (SP-32)
No 69 Line
CONTRACT MR-550
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
MUNICIPAL RAILWAY
POWELL & JACKSON STS.
CABLE CAR TRACK PULL CURVE
CHAFING BAR REPLACEMENT
REVISIONS
CL-5171
0

FIGURE 2.8.a

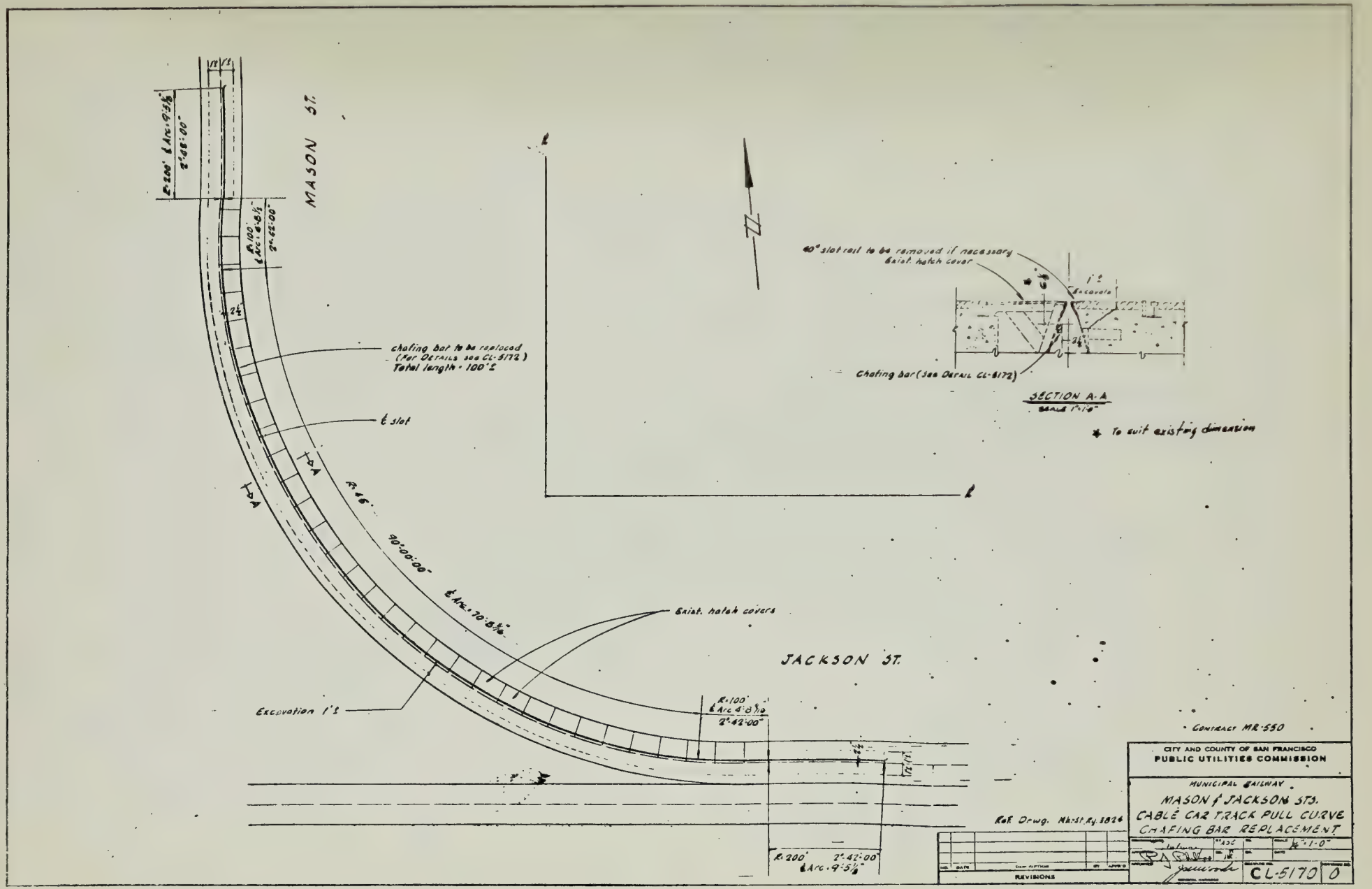

MASON ST.
JACKSON ST.
chafing bar to be replaced (Per Details see CL-5172) Total length = 100'±
℄ slot
Excavation 1'±
Exist. hatch covers
R=16'
90°00'00"
℄ Arc = 70°8½"
R=100' ℄ Arc 9°8½" 2°42'00"
R=200' 2°42'00" ℄ Arc 9°5½"
40" slot rail to be removed if necessary Exist. hatch cover
Chafing bar (See Detail CL-5172)
SECTION A-A
* To suit existing dimension
Ref. Drwg. Mkt St. Ry 5026
CONTRACT MR-550
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
MUNICIPAL RAILWAY
MASON & JACKSON STS.
CABLE CAR TRACK PULL CURVE
CHAFING BAR REPLACEMENT
REVISIONS
CL-5170
0

FIGURE 2.8.b

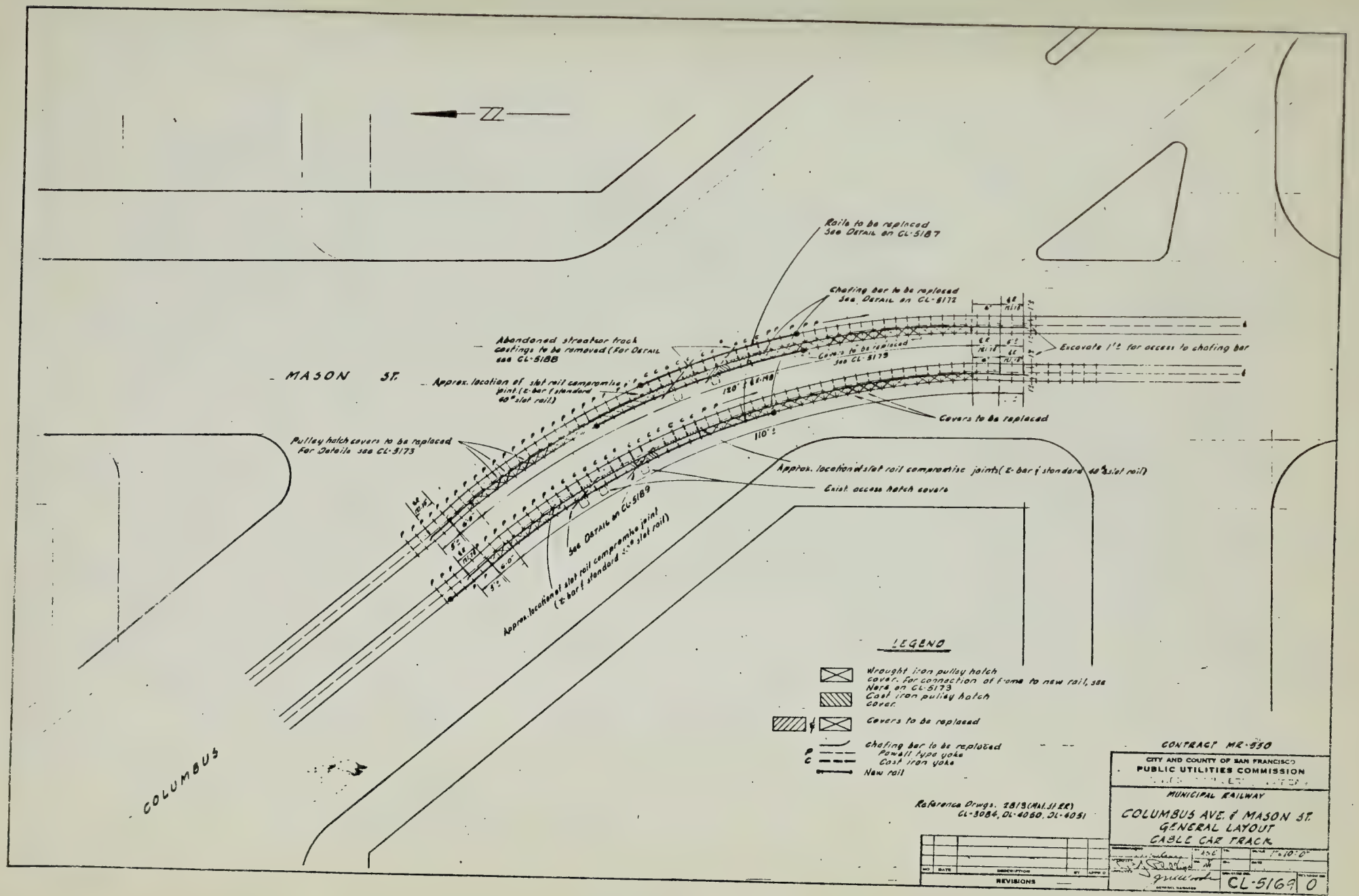

Rails to be replaced See Detail on CL-5187
Chafing bar to be replaced See Detail on CL-5172
Abandoned streetcar track castings to be removed (For Detail see CL-5188
Covers to be replaced see CL-5173
Excavate 1'± for access to chafing bar
MASON ST.
Approx. location of slot rail compromise joint (T-bar standard 40" slot rail)
120'±
Covers to be replaced
Pulley hatch covers to be replaced For Details see CL-5173
110'±
Approx. location of slot rail compromise joints (T-bar standard 40" slot rail)
Exist. access hatch covers
See Detail on CL-5189
Approx. location of slot rail compromise joint (T-bar standard 40" slot rail)
COLUMBUS
LEGEND
Wrought iron pulley hatch cover. For connection of frame to new rail, see Note on CL-5173
Cast iron pulley hatch cover.
Covers to be replaced
Chafing bar to be replaced
P Powell type yoke
C Cast iron yoke
New rail
Reference Drwgs. 2813(ALL SHEETS) CL-3084, DL-4060, DL-4051
CONTRACT MR-930
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
MUNICIPAL RAILWAY
COLUMBUS AVE. & MASON ST.
GENERAL LAYOUT
CABLE CAR TRACK
1"=10'-0"
CL-5169
0
REVISIONS

FIGURE 2.8.c

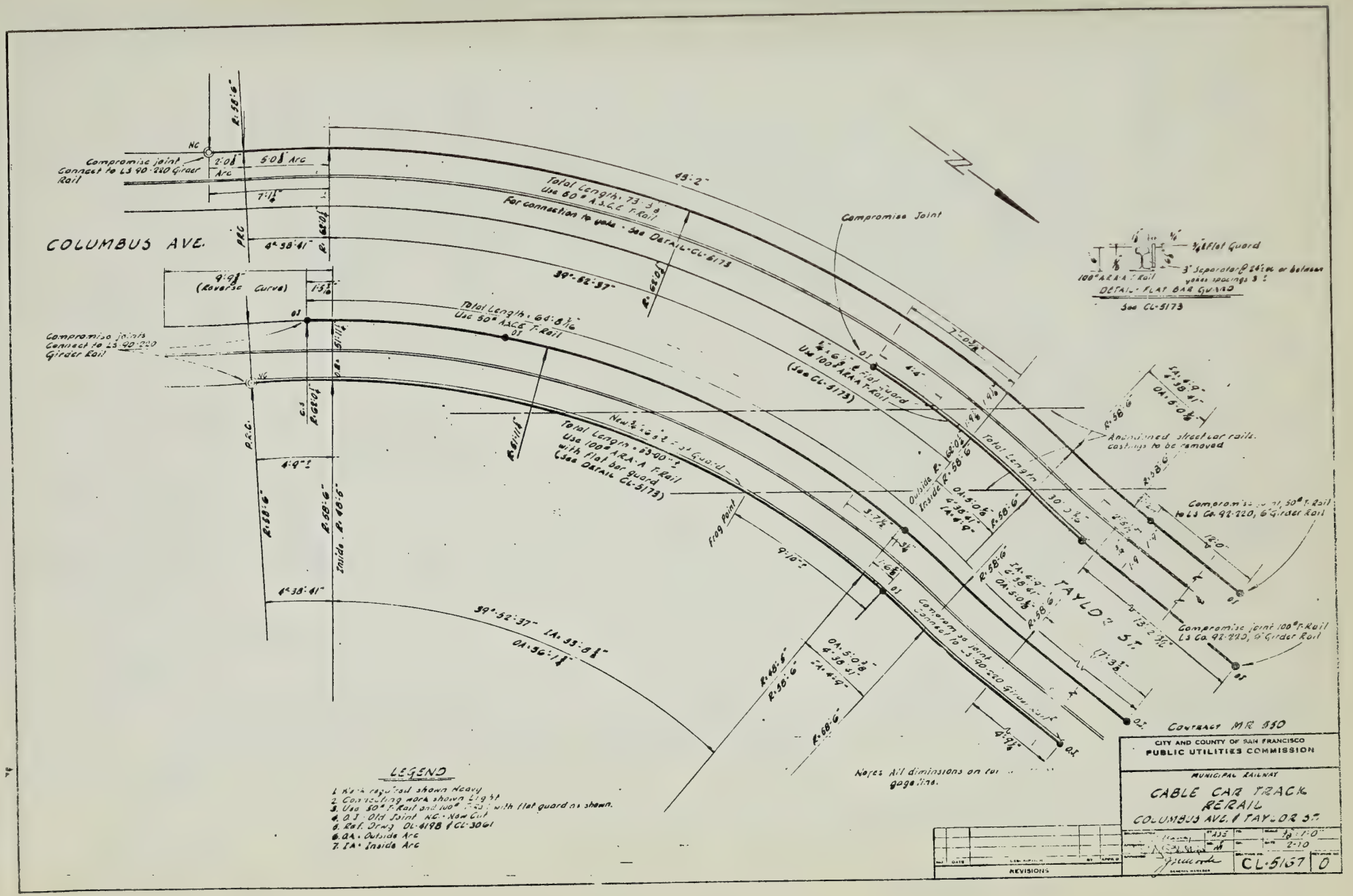

COLUMBUS AVE.
TAYLOR ST.
Compromise joint Connect to LS 90-220 Girder Rail
Total Length 73'-3" Use 80# ASCE T-Rail
For connection to weld - See Detail CL-5173
Total Length 64'-8 1/16" Use 90# ASCE T-Rail
Total Length 63'-0" Use 100# ARA-A T-Rail with flat bar guard (See Detail CL-5173)
Compromise Joint
Frog Point
Compromise joint Connect to LS 90-220 Girder Rail
Abandoned street car rails, castings to be removed
Compromise joint, 90# T-Rail to LS Co. 92-220, 6" Girder Rail
Compromise joint 100# T-Rail LS Co. 92-220, 6" Girder Rail
DETAIL - FLAT BAR GUARD
See CL-5173
LEGEND
1. R's & radius shown Heavy
2. Connecting work shown Light
3. Use 90# T-Rail and 100# ARA-A with flat guard as shown.
4. O.J. - Old Joint NC - New Cut
5. Ref. Drwg. DL-4198 & CL-3061
6. OA. - Outside Arc
7. IA. - Inside Arc
Notes All dimensions on rail are gage line.
CONTRACT MR 850
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
MUNICIPAL RAILWAY
CABLE CAR TRACK RERAIL
COLUMBUS AVE. & TAYLOR ST.
REVISIONS
CL-5157 0

FIGURE 2.8.d

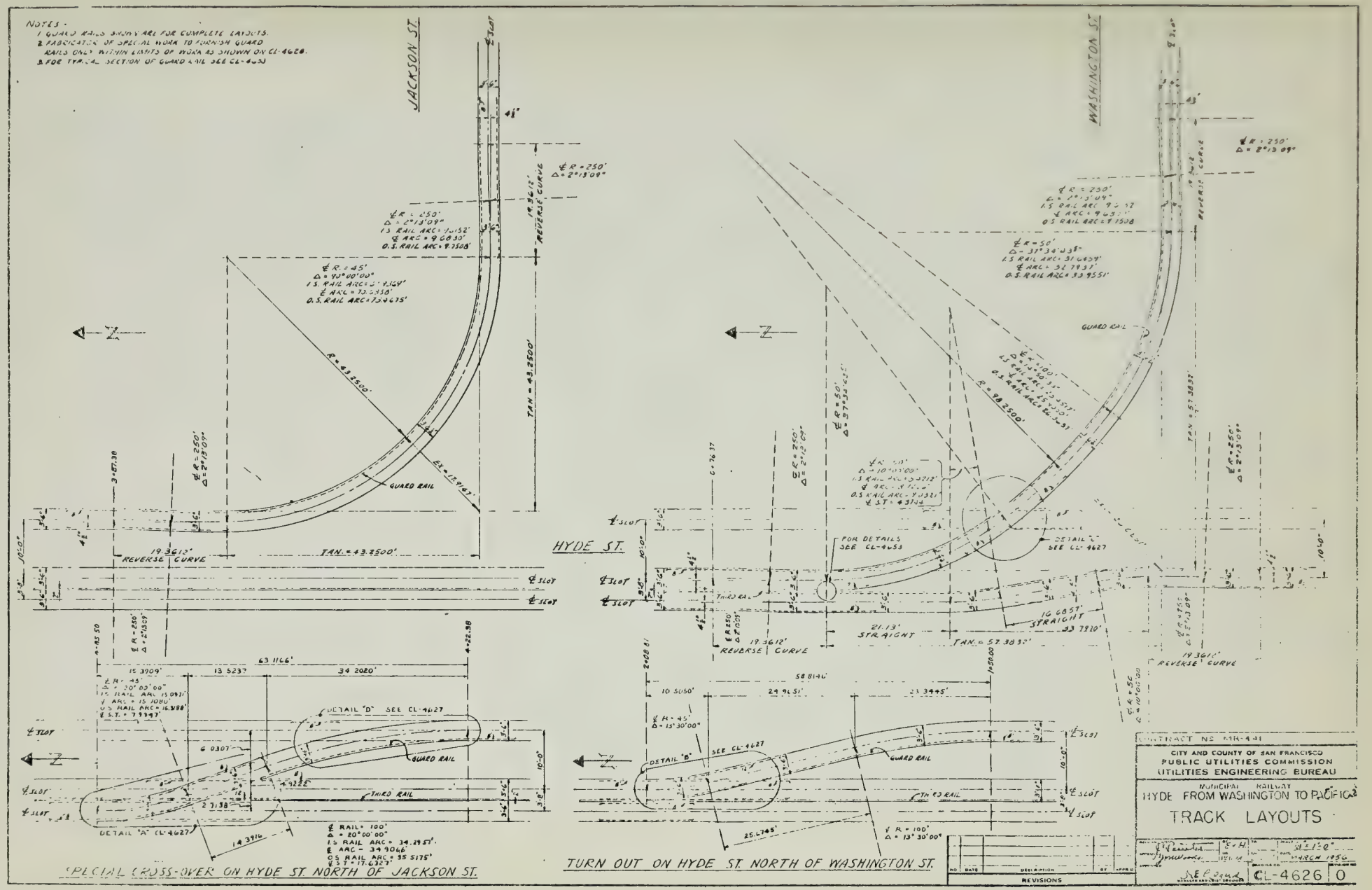

NOTES:
1 GUARD RAILS SHOWN ARE FOR COMPLETE LAYOUTS.
2 FABRICATION OF SPECIAL WORK TO FURNISH GUARD RAILS ONLY WITHIN LIMITS OF WORK AS SHOWN ON CL-4626.
3 FOR TYPICAL SECTION OF GUARD RAIL SEE CL-4633
JACKSON ST.
WASHINGTON ST.
HYDE ST.
GUARD RAIL
REVERSE CURVE
TAN. = 43.2500'
THIRD RAIL
DETAIL "A" CL-4627
DETAIL "B" SEE CL-4627
DETAIL "D" SEE CL-4627
SPECIAL CROSS-OVER ON HYDE ST. NORTH OF JACKSON ST.
TURN OUT ON HYDE ST. NORTH OF WASHINGTON ST.
CONTRACT NO MR-441
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY
HYDE FROM WASHINGTON TO PACIFIC
TRACK LAYOUTS
REVISIONS
CL-4626 0

FIGURE 2.8.e

FIGURE 2.8.f

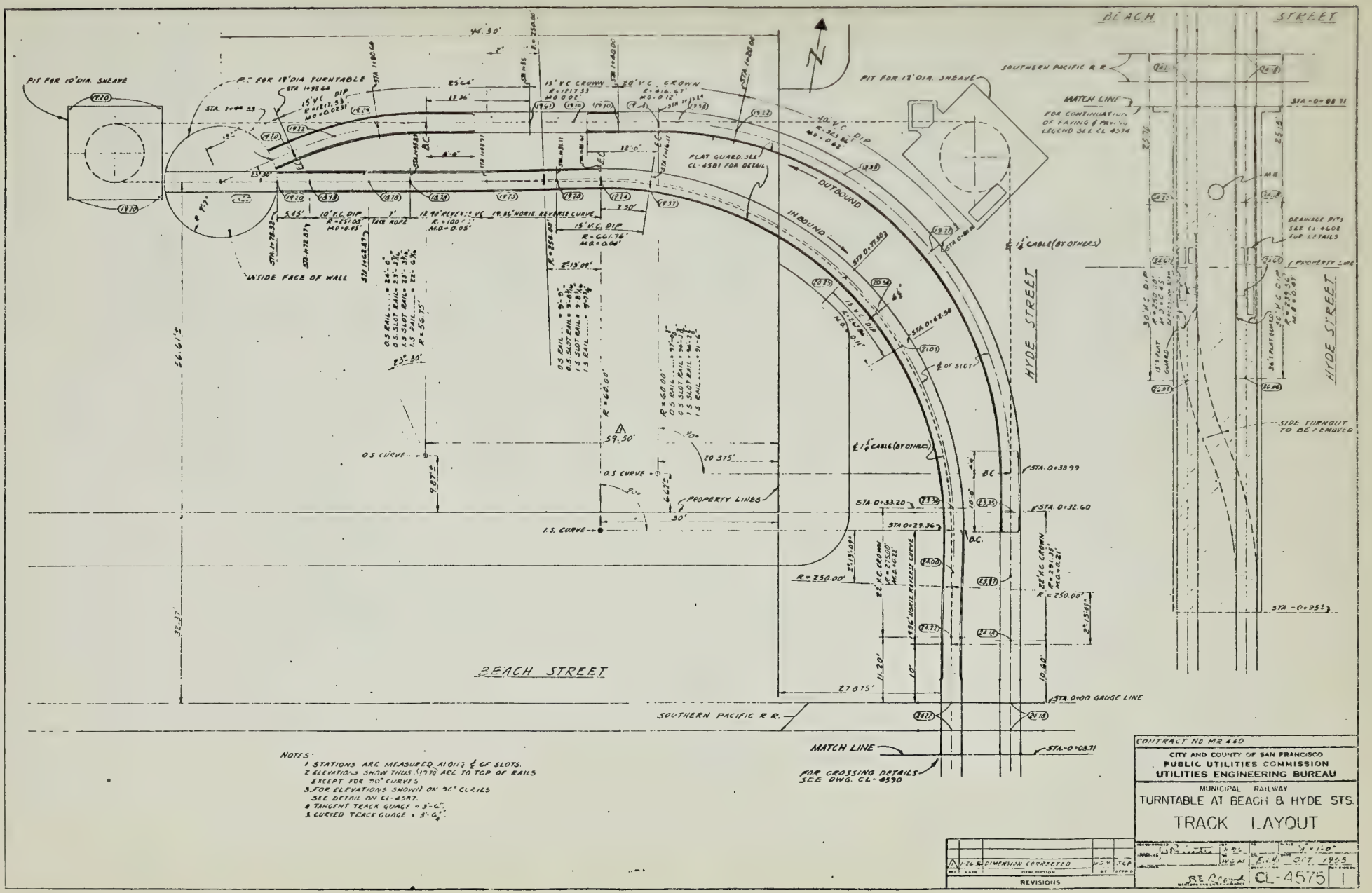

BEACH STREET
HYDE STREET
SOUTHERN PACIFIC R.R.
PIT FOR 19' DIA. TURNTABLE
PIT FOR 10' DIA. SHEAVE
PIT FOR 12' DIA. SHEAVE
INSIDE FACE OF WALL
OUTBOUND
INBOUND
PROPERTY LINES
MATCH LINE
FOR CROSSING DETAILS SEE DWG. CL-4590
SIDE TURNOUT TO BE REMOVED
DRAINAGE PITS SEE CL-4608 FOR DETAILS
NOTES:
1. STATIONS ARE MEASURED ALONG ℄ OF SLOTS.
2. ELEVATIONS SHOWN THUS (19.70) ARE TO TOP OF RAILS EXCEPT FOR 90° CURVES.
3. FOR ELEVATIONS SHOWN ON 90° CURVES SEE DETAIL ON CL-4587.
4. TANGENT TRACK GUAGE = 5'-6".
5. CURVED TRACK GUAGE = 5'-6½".
CONTRACT NO MR 460
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY
TURNTABLE AT BEACH & HYDE STS.
TRACK LAYOUT
REVISIONS
CL-4575

FIGURE 2.8.g

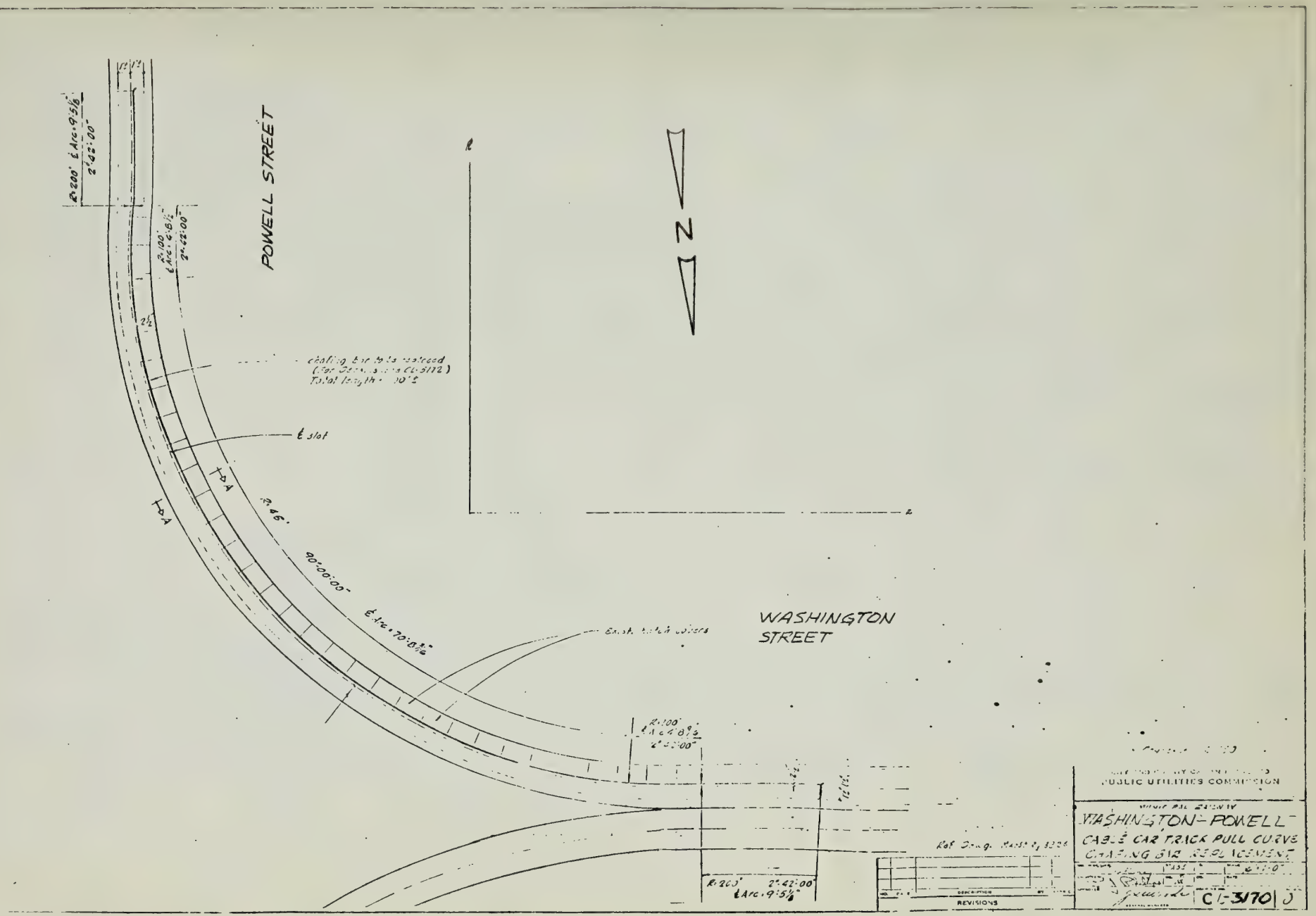

POWELL STREET
WASHINGTON STREET
N
PUBLIC UTILITIES COMMISSION
WASHINGTON-POWELL
CABLE CAR TRACK PULL CURVE
CHASING BAR REPLACEMENT
REVISIONS
C1-3170

FIGURE 2.8.h

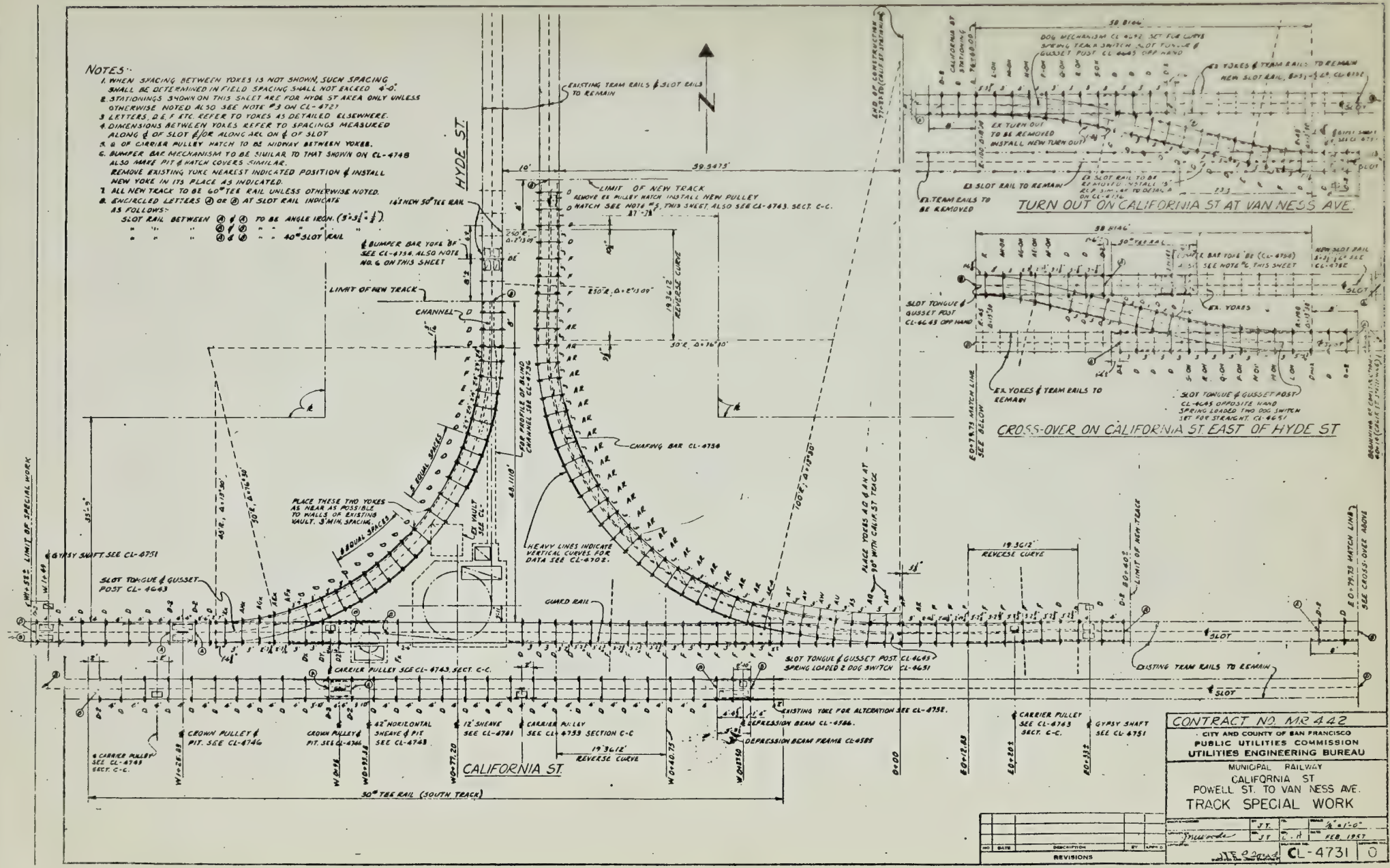

NOTES:
1. WHEN SPACING BETWEEN YOKES IS NOT SHOWN, SUCH SPACING SHALL BE DETERMINED IN FIELD. SPACING SHALL NOT EXCEED 4'-0".
2. STATIONINGS SHOWN ON THIS SHEET ARE FOR HYDE ST. AREA ONLY UNLESS OTHERWISE NOTED. ALSO SEE NOTE #3 ON CL-4727.
3. LETTERS, D, E, F, ETC. REFER TO YOKES AS DETAILED ELSEWHERE.
4. DIMENSIONS BETWEEN YOKES REFER TO SPACINGS MEASURED ALONG ℄ OF SLOT ℄/OR ALONG ARC ON ℄ OF SLOT.
5. ⊕ OF CARRIER PULLEY HATCH TO BE MIDWAY BETWEEN YOKES.
6. BUMPER BAR MECHANISM TO BE SIMILAR TO THAT SHOWN ON CL-4748 ALSO MARK PIT ℄ HATCH COVERS SIMILAR. REMOVE EXISTING YOKE NEAREST INDICATED POSITION ℄ INSTALL NEW YOKE IN ITS PLACE AS INDICATED.
7. ALL NEW TRACK TO BE 60# TEE RAIL UNLESS OTHERWISE NOTED.
8. ENCIRCLED LETTERS Ⓐ OR Ⓑ AT SLOT RAIL INDICATE AS FOLLOWS:
SLOT RAIL BETWEEN Ⓐ ℄ Ⓐ TO BE ANGLE IRON. (3"x3"x ½")
" " " Ⓑ ℄ Ⓑ " - " "
" " " Ⓐ ℄ Ⓑ " - 40# SLOT RAIL
HYDE ST.
EXISTING TEAM RAILS ℄ SLOT RAILS TO REMAIN
LIMIT OF NEW TRACK
REMOVE EX PULLEY HATCH INSTALL NEW PULLEY HATCH SEE NOTE #6 THIS SHEET. ALSO SEE CA-4743, SECT. C-C.
16# NEW 50# TEE RAIL
BUMPER BAR YOKE "BB" SEE CL-4736. ALSO NOTE NO. 6 ON THIS SHEET
CHANNEL
850' R, Δ=2°13'09"
19.36'12" REVERSE CURVE
50' R, Δ=76°10'
CHAFING BAR CL-4736
FOR PROFILE OF BLIND CHANNEL SEE CL-4736
6 EQUAL SPACES
PLACE THESE TWO YOKES AS NEAR AS POSSIBLE TO WALLS OF EXISTING VAULT. 3'MIN. SPACING.
EX VAULT SEE CL-
HEAVY LINES INDICATE VERTICAL CURVES. FOR DATA SEE CL-4702.
100' R, Δ=13°40'
PLACE YOKES AG ℄ AH AT 90° WITH CALIF ST TRACK
19.36'12" REVERSE CURVE
LIMIT OF NEW TRACK
GUARD RAIL
GYPSY SWITCH SEE CL-4751
SLOT TONGUE ℄ GUSSET POST CL-4643
SLOT TONGUE ℄ GUSSET POST CL-4643 SPRING LOADED 2 DOG SWITCH CL-4651
EXISTING TEAM RAILS TO REMAIN
SLOT
CARRIER PULLEY SEE CL-4743 SECT. C-C.
EXISTING YOKE FOR ALTERATION SEE CL-4752.
DEPRESSION BEAM CL-4586.
DEPRESSION BEAM FRAME CL-4585
CROWN PULLEY ℄ PIT. SEE CL-4746
CROWN PULLEY ℄ PIT. SEE CL-4746
42" HORIZONTAL SHEAVE ℄ PIT SEE CL-4743
12" SHEAVE SEE CL-4781
CARRIER PULLEY SEE CL-4739 SECTION C-C
19.36'12" REVERSE CURVE
CALIFORNIA ST.
50# TEE RAIL (SOUTH TRACK)
CARRIER PULLEY SEE CL-4743 SECT. C-C.
CARRIER PULLEY SEE CL-4743 SECT. C-C.
GYPSY SHAFT SEE CL-4751
LIMIT OF SPECIAL WORK SEE
SEE CROSS-OVER ABOVE
TURN OUT ON CALIFORNIA ST AT VAN NESS AVE.
DOG MECHANISM CL 4092 SET FOR CURVE SPRING TRAIL SWITCH SLOT TONGUE ℄ GUSSET POST CL 4643 OPP HAND
EX YOKES ℄ TEAM RAILS TO REMAIN
NEW SLOT RAIL
EX TURN OUT TO BE REMOVED INSTALL NEW TURN OUT
EX SLOT RAIL TO BE REMOVED INSTALL 15' RCP SLOT AS PER DETAIL A ON CL-4736
EX SLOT RAIL TO REMAIN
EX. TEAM RAILS TO BE REMOVED
CROSS-OVER ON CALIFORNIA ST. EAST OF HYDE ST
BUMPER BAR YOKE "BB" (CL-4736) SEE NOTE #6 THIS SHEET
NEW SLOT RAIL
SLOT TONGUE ℄ GUSSET POST CL-4643 OPP HAND
EX. YOKES
EX YOKES ℄ TEAM RAILS TO REMAIN
SLOT TONGUE ℄ GUSSET POST CL-4643 OPPOSITE HAND SPRING LOADED TWO DOG SWITCH SET FOR STRAIGHT. CL-4651
CONTRACT NO. MR 442
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY
CALIFORNIA ST
POWELL ST. TO VAN NESS AVE.
TRACK SPECIAL WORK
REVISIONS
CL-4731
FEB. 1947

FIGURE 2.8.i

Section 2.9

BUMPER BARS

Bumper bars are located on Powell at Ellis (inbound), Powell at California (inbound and outbound), California at Drumm (inbound), California at Mason (outbound), California at Hyde (outbound), Hyde at California (outbound), Hyde at Washington (inbound), Jackson at Hyde (outbound), Hyde at Beach (outbound), Washington at Mason (inbound), Jackson at Mason (outbound), Taylor at Bay (outbound), and Mason at Washington (inbound).

2.9.1 Description (see Figure 2.9.a)

Bumper -- mild steel, 2 in. diameter, attached to yoke with 2 x 2-1/2 in. flat bars, with glass vial containing white paint taped on. Alarm -- pulley, 7 in. outward diameter; counterweight, 6 cu in. on 3/4 x 18 in. bar supported by 1/2 x 4 in. bar attached to bumper; bell, 9-3/4 in. outside diameter.

2.9.2 Inspection

Of the 14 bumper bars, 11 were in good condition -- bar and paint vial in place and bell pulley free to rotate; and 3 were in poor condition -- bell pulley not free to rotate.

2.9.3 Evaluation

Bumper bars perform the function for which they were designed, but sometimes damage the cable severely.

Figures

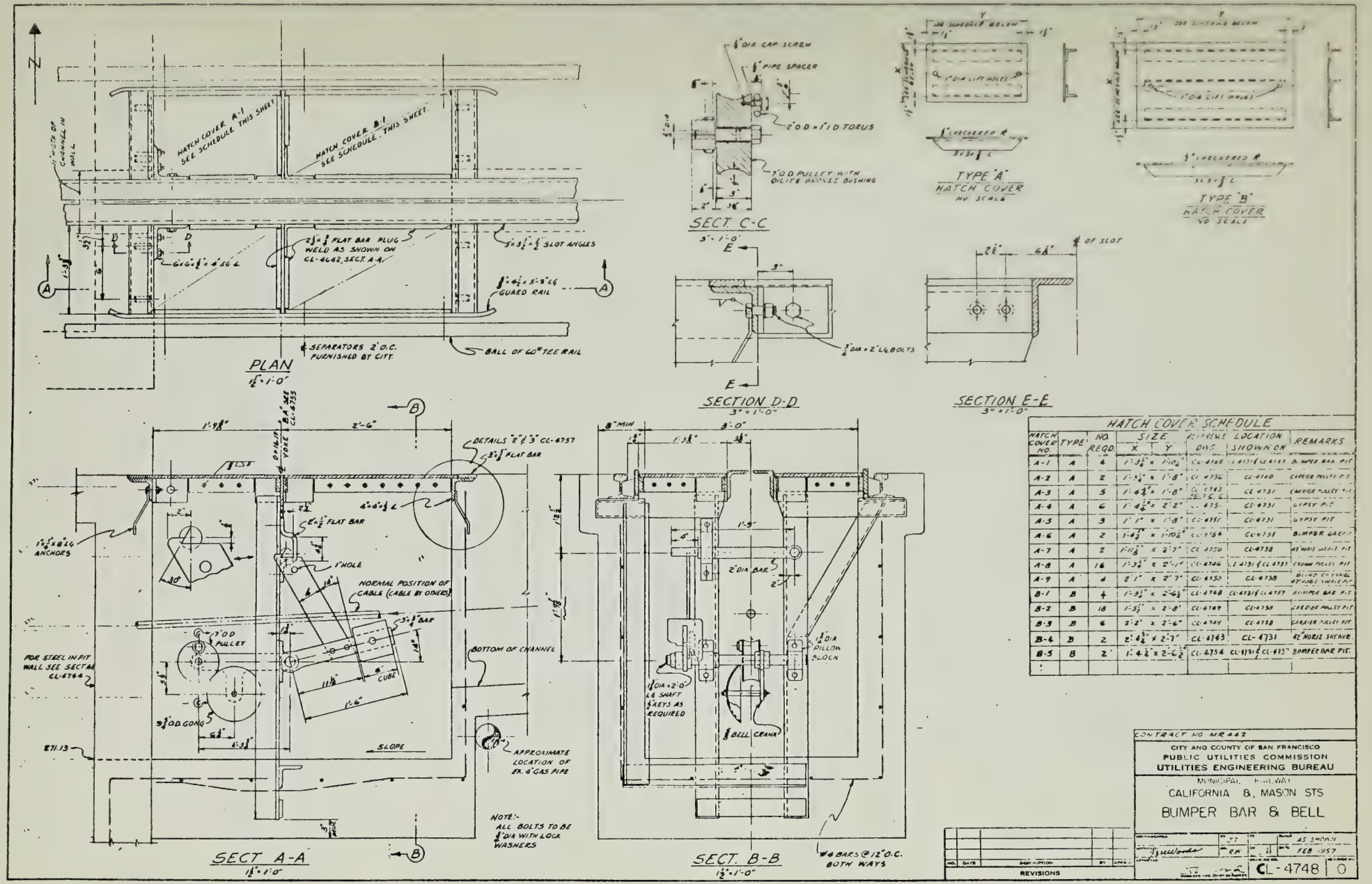

PLAN
SECT. C-C
SECTION D-D
SECTION E-E
TYPE 'A' HATCH COVER
TYPE 'B' HATCH COVER
SECT A-A
SECT. B-B
HATCH COVER SCHEDULE
CONTRACT NO MR 442
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY
CALIFORNIA & MASON STS
BUMPER BAR & BELL
REVISIONS
CL-4748

FIGURE 2.9.a

Section 2.10

TAKE-ROPE GYPSIES

Only five of the seven take-rope gypsies in the street are in use. They are located on California St at Drumm St and Hyde St, on Hyde St between Washington and Jacksons sts and between Jackson and Pacific sts, and at Bay and Taylor sts. A second one on California at Hyde and another on California at Van Ness Av are not used.

2.10.1 Description (see Figures 2.10.a,b)

Lever -- 50 in. from fulcrum to tip. Lever arm -- 12 in. long. Pulley -- 9 in. diameter, with bronze bushing and a 1-1/2 in. shaft. Mechanism housed in a 2 x 3 x 2-1/2 ft subsurface pit.

2.10.2 Inspection

Of the five gypsies in use, 4 were in good condition -- lever arm securely attached to pivot shaft, pivot shaft a snug fit in pivot bearing, bearing housing securely anchored to channel bottom, pulley no more than slightly worn at cable groove, and pulley bearing a good fit on shaft; one was in fair condition -- same as good condition, except pulley considerably worn at cable groove and pulley bearing loose on shaft.

2.10.3 Evaluation

The gypsy serves its function, but dips are more efficient because the conductor is not required to leave the car.

Figures

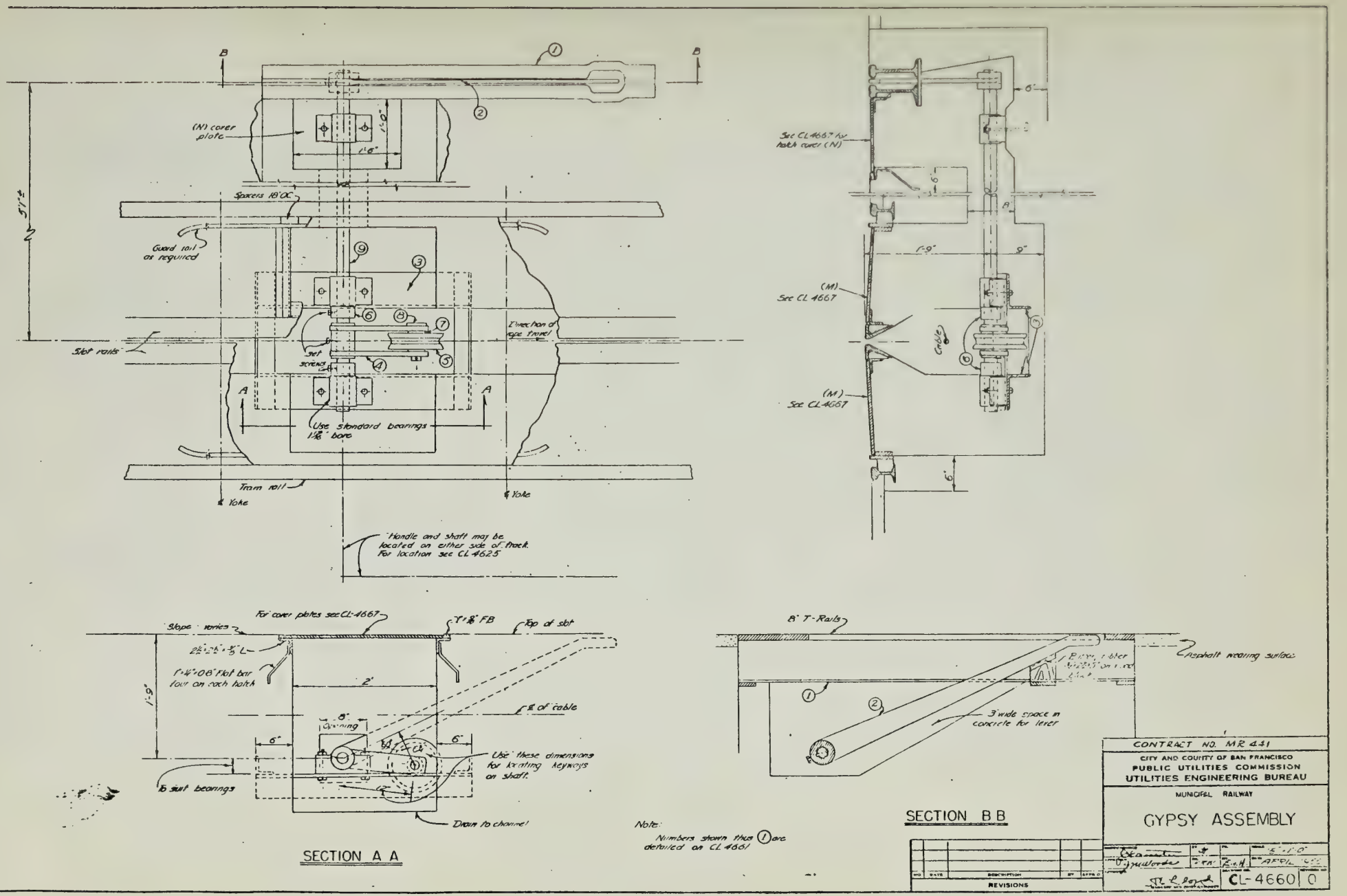

(N) cover plate
Spacers 18" OC
Guard rail as required
Slot rails
Set screws
Direction of cable travel
Use standard bearings 1⅞" bore
Tram rail
℄ Yoke
℄ Yoke
Handle and shaft may be located on either side of track. For location see CL-4625
See CL-4667 for hatch cover (N)
(M) See CL-4667
(M) See CL-4667
Cable
Slope varies
For cover plates see CL-4667
Top of slot
1'-9"
2'
℄ of cable
Grooving
Use these dimensions for locating keyways on shaft.
To slot bearings
Drain to channel
SECTION A A
8" T-Rails
Asphalt wearing surface
3' wide space in concrete for lever
SECTION B B
Note: Numbers shown thus ① are detailed on CL-4661
CONTRACT NO. MR 441
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY
GYPSY ASSEMBLY
REVISIONS
CL-4660 0

FIGURE 2.10.a

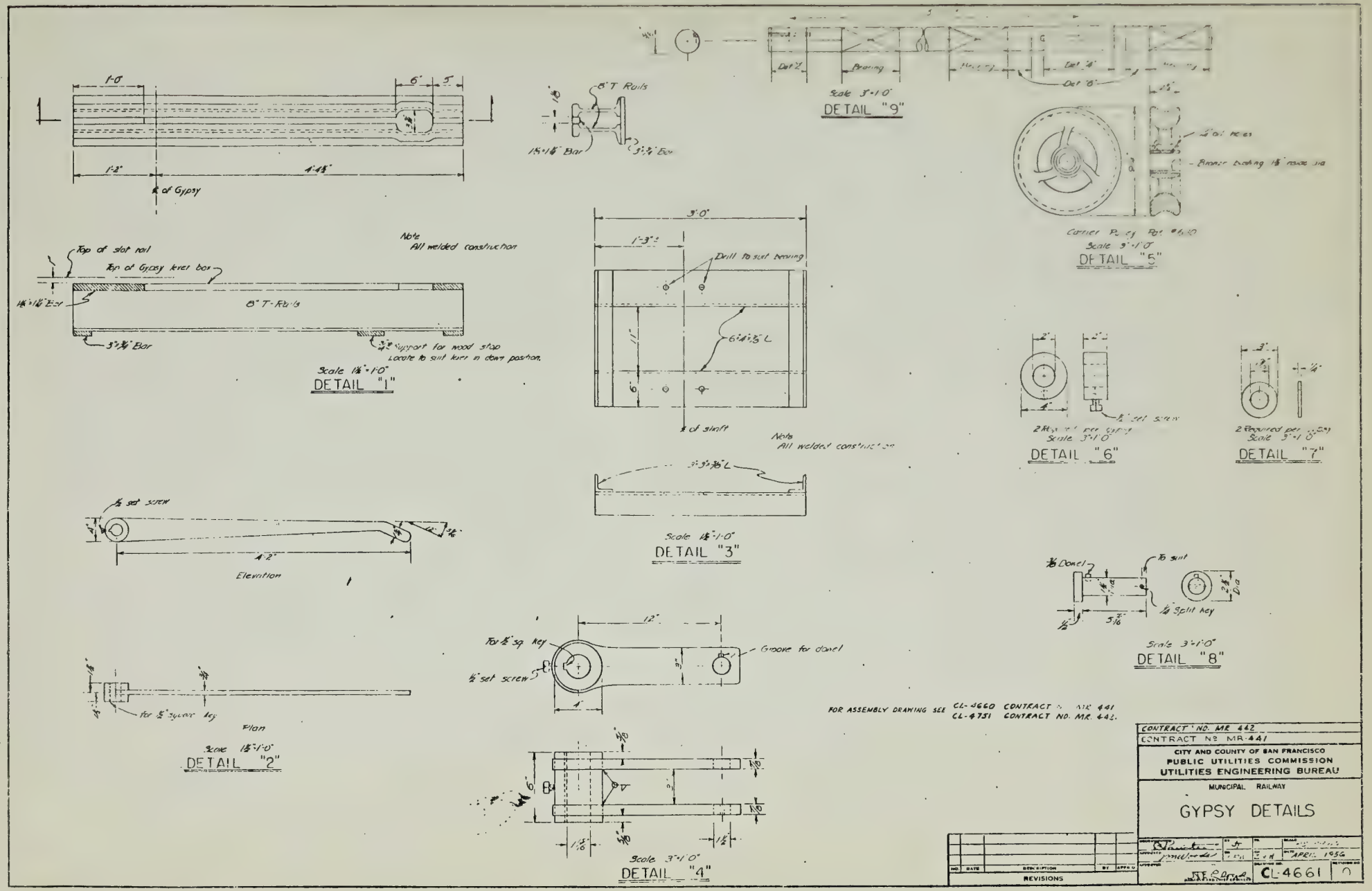

DETAIL "1"
DETAIL "2"
DETAIL "3"
DETAIL "4"
DETAIL "5"
DETAIL "6"
DETAIL "7"
DETAIL "8"
DETAIL "9"
Note All welded construction
Elevation
Plan
FOR ASSEMBLY DRAWING SEE CL-4660 CONTRACT NO. MR 441
CL-4731 CONTRACT NO. MR. 442.
CONTRACT NO. MR 442
CONTRACT No MR-441
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY
GYPSY DETAILS
APRIL 1956
CL-4661
REVISIONS

FIGURE 2.10.b

Section 2.11

SAFETY LATCHES

Safety latches are located outbound on Powell St at California St (2), inbound on Hyde St at Chestnut St (2), outbound on California St at Mason St, inbound on Mason St at Green St, and outbound on California St at Stockton St.

2.11.1 Description

Tongue -- two 3/4 in. thick steel plates (ASTM A36) welded together, 3 in. wide, 11-1/8 in. long, 7-3/4 in. centerline of pivot to edge, with 1 in. diameter, pivot pin. Frame -- 1 x 4 in. mild steel bars, with 33-1/8 x 12 x 1/2 in. diamond cover plate. Mounting bolts -- 3/4 in. Spring return mechanism -- 9-1/2 in., 18 coil, 1-1/2 in. outside diameter, #5 gauge.

2.11.2 Inspection (7 latches)

Tongues: 6 good -- little wear by grips, snug fit at pivot pin, moves freely across slot; 1 fair (hatch PO776, Powell at California) -- slight depression at edge, snug fit at pivot pin, moves freely across slot. Frames: 7 good -- no distortion and securely anchored to slot rail.

2.11.3 Evaluation

Under the impact of a car on a safety latch, the grip will bend at a load of about 10,000 lb, the pivot pin will shear at a load of about 70,000 lb (the latch would move about one in. to the rear and become jammed in its housing), and the grip will fail in tension or the latch tongue will shear at about 180,000 lb. Before a load of 180,000 lb is reached, the grip track will have been ripped from the cable car or the latch frame and housing will have been torn out of the street. Impact creating such loads occurs only if the car rolls back down a hill about one block. Ordinarily, the car rolls back only a few ft and is stopped gently by the latch.

Section 2.12

TURNTABLES

Turntables are located at Powell and Market sts, at Bay and Taylor sts, and in Victorian Park.

2.12.1 Description

Table 19 ft in diameter, steel frame with standard sections (ASTM 36) supporting wood decking, with running rail and slot rail; 70 lb inverted Tee rail bent to 6 ft radius and attached to bottom of table, riding on 12 tapered flangeless cast-steel wheels mounted with brass bushings on spider attached to central pivot shaft; wheels ride on 70 lb Tee rail, bent to 6 ft radius and mounted on a concrete foundation. Central pivot provides partial support for table through thrust buttons.

2.12.2 Inspection

Powell and Market

Framing of table warped. Decking has been shimmed to keep surface level. Upper and lower rails not level and not parallel, and table is not being supported by all 12 bearing wheels at the same time. Many bolts attaching timbers to steel framing are loose.

Bay and Taylor

All components in good condition, except frame rusted, latch tongue worn excessively. Mounting on latch support broken, and latch handle bent and guides loose.

Victorian Park (See Figures 2.12a,b,c,d)

All components in good condition, except dry rot in wooden hatch in wooden deck. Bearings loose. Frame rusted.

2.12.3 Evaluation

Tables are too small in relation to wheel base, creating difficulties in positioning car. Wood decking is subject to swelling in bad weather and binds hatch covers. Supporting circular rails are located too far from rim, with result that table framing warps. Manual rotation difficult and unsafe for personnel in wet weather. Latches are undersized and wear quickly. Provision for conditions where car overruns table is inadequate.

Figures

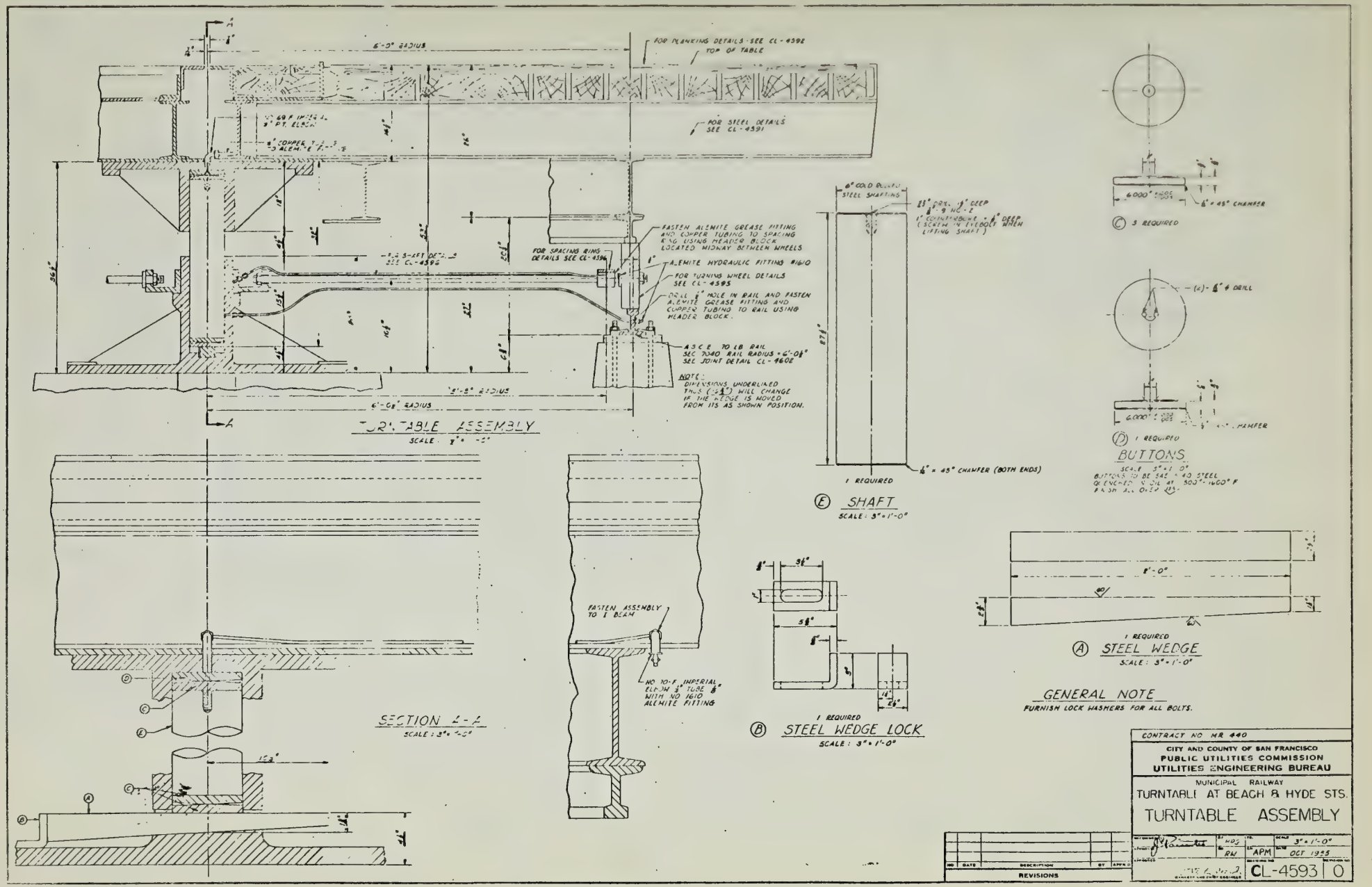

6'-0" RADIUS
FOR PLANKING DETAILS SEE CL-4592
TOP OF TABLE
FOR STEEL DETAILS SEE CL-4591
FOR SPACING RING DETAILS SEE CL-4594
FASTEN ALEMITE GREASE FITTING AND COPPER TUBING TO SPACING RING USING HEADER BLOCK LOCATED MIDWAY BETWEEN WHEELS
ALEMITE HYDRAULIC FITTING #1610
FOR TURNING WHEEL DETAILS SEE CL-4595
DRILL 1/4" HOLE IN RAIL AND FASTEN ALEMITE GREASE FITTING AND COPPER TUBING TO RAIL USING HEADER BLOCK.
A.S.C.E. 70 LB. RAIL SEC 7040 RAIL RADIUS = 6'-0" SEE JOINT DETAIL CL-4602
NOTE: DIMENSIONS UNDERLINED THUS (5'-8") WILL CHANGE IF THE "A" ZONE IS MOVED FROM ITS AS SHOWN POSITION.
5'-8" RADIUS
6'-0" RADIUS
TURNTABLE ASSEMBLY
SCALE: 3" = 1'-0"
SECTION A-A
SCALE: 3" = 1'-0"
FASTEN ASSEMBLY TO I BEAM
NO 10-F IMPERIAL ELBOW 3/8" TUBE 1/8" WITH NO 1610 ALEMITE FITTING
6" COLD ROLLED STEEL SHAFTING
1 REQUIRED
6" x 45° CHAMFER (BOTH ENDS)
(E) SHAFT
SCALE: 3" = 1'-0"
3 REQUIRED
6" x 45° CHAMFER
(C)
1 REQUIRED
(D)
BUTTONS
SCALE 3" = 1'-0"
1 REQUIRED
(A) STEEL WEDGE
SCALE: 3" = 1'-0"
1 REQUIRED
(B) STEEL WEDGE LOCK
SCALE: 3" = 1'-0"
GENERAL NOTE
FURNISH LOCK WASHERS FOR ALL BOLTS.
REVISIONS
CONTRACT NO. MR 440
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY
TURNTABLE AT BEACH & HYDE STS.
TURNTABLE ASSEMBLY
APM
OCT 1955
CL-4593 0

FIGURE 2.12.a

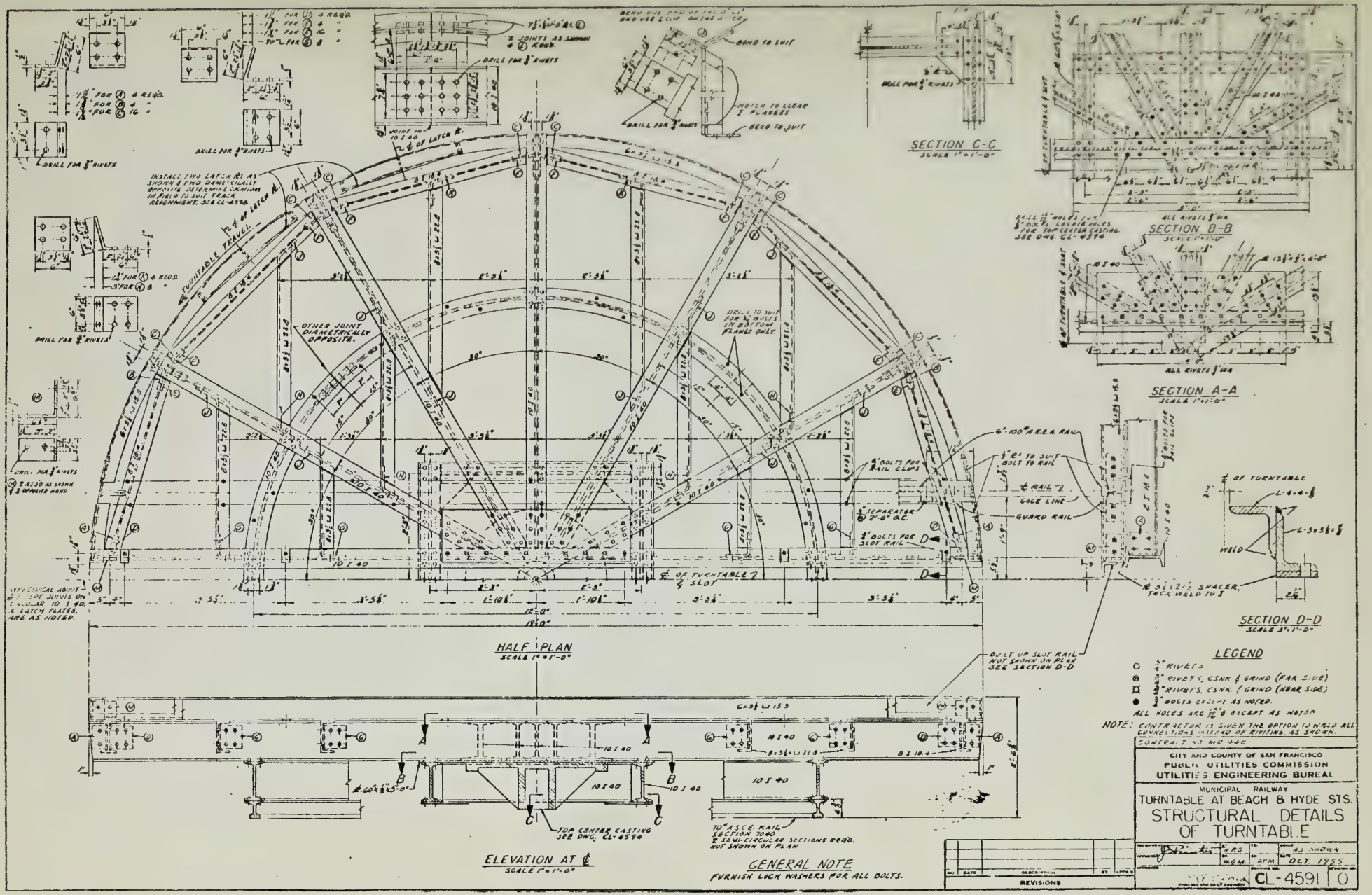

SECTION C-C
SCALE 1"=1'-0"
SECTION B-B
SCALE 1"=1'-0"
SECTION A-A
SCALE 1"=1'-0"
SECTION D-D
SCALE 3"=1'-0"
HALF PLAN
SCALE 1"=1'-0"
ELEVATION AT ℄
SCALE 1"=1'-0"
GENERAL NOTE
FURNISH LOCK WASHERS FOR ALL BOLTS.
LEGEND
NOTE: CONTRACTOR IS GIVEN THE OPTION TO WELD ALL CONNECTIONS INSTEAD OF RIVETING, AS SHOWN.
CONTRACT NO MR 340
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY
TURNTABLE AT BEACH & HYDE STS.
STRUCTURAL DETAILS OF TURNTABLE
OCT. 1955
CL-4591
REVISIONS

FIGURE 2.12.b

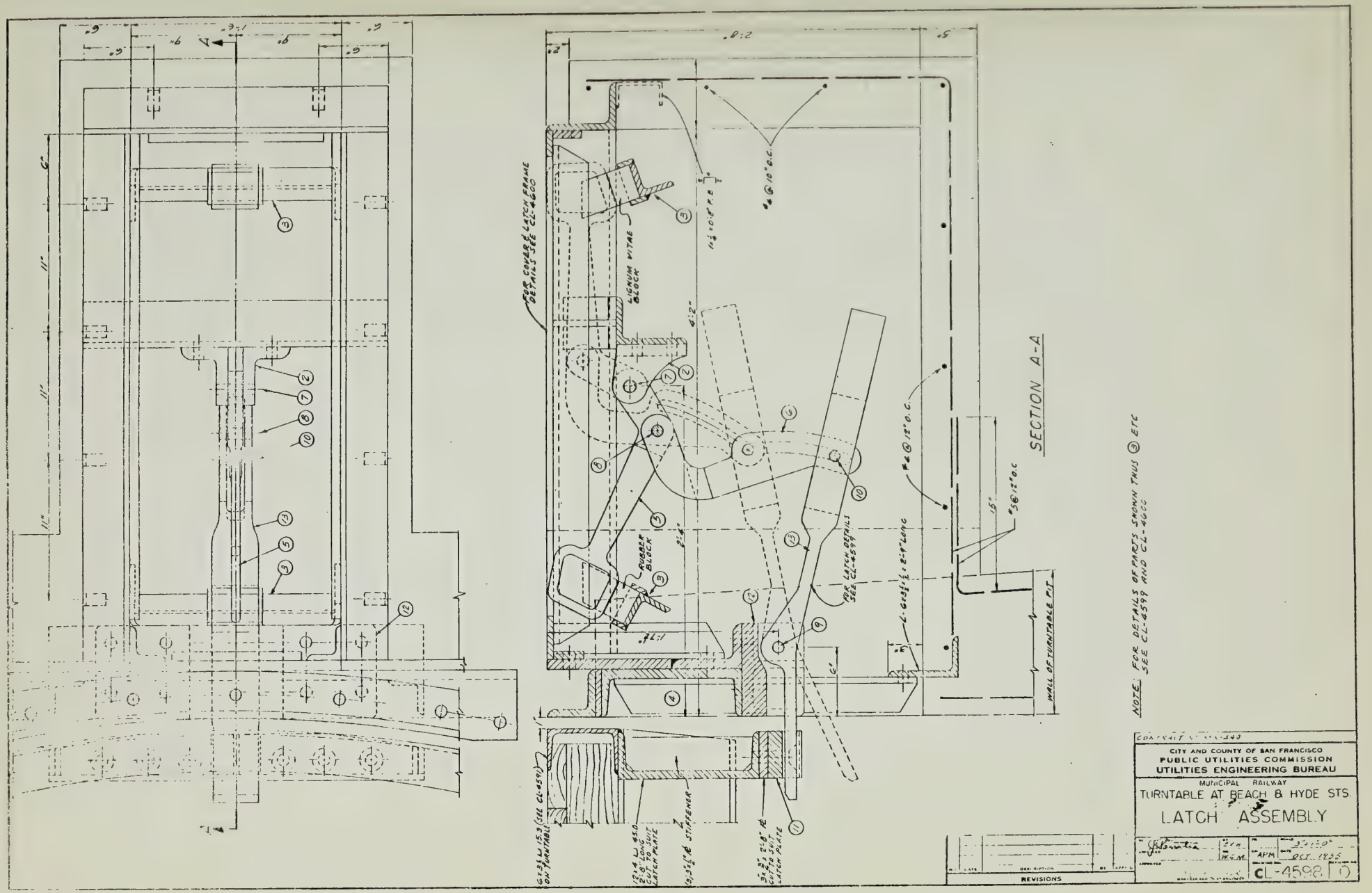

SECTION A-A
NOTE: FOR DETAILS OF PARTS SHOWN THUS ③ ETC SEE CL-4599 AND CL-4600
CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU
MUNICIPAL RAILWAY
TURNTABLE AT BEACH & HYDE STS.
LATCH ASSEMBLY
CL-4598
REVISIONS

FIGURE 2.12.c

Section 2.13

HATCHES

2.13.1 Description

Of 1921 hatches inspected, 1239 of the covers were wrought iron fabricated with rivets; 458 were steel fabricated by using electrical arc or flame welding; 202 were wood, made of one or two planks or three or four planks nailed together with 1 x 6 in. planks, and 22 were cast iron. Frames were cast iron or steel.

Covers, with frames, include (by type of equipment, size, and number):

Carrying Pulleys	
10-1/2 x 15-1/2 in.	1376
Crown Pulleys	
16 x 24 in.	158
16 x 30 in.	6
16 x 32 in.	72
16 x 34 in.	92
16 x 42 in.	2
16 x 46 in.	10
Depression Beams	
10 x 69 in.	71
14 x 16 in.	71

Pull Curves

16 x 36 in 368

Horizontal Sheaves

covers (20 x 24 in.) 14

frames (20 x 48 in.) 7

Grip take-outs

12 x 24 in. 42

Safety Latch

10 x 24 in. 7

Gypsies

16 x 24 in. 12

12 x 18 in. 6

Traffic Control Switches

10-1/2 x 15-1/2 in. 58

Sewers

10-1/2 x 15-1/2 in. 10

Bumper Bars

15-1/4 x 22-1/4 in. 56

Summary

10 x 24 in. 7

10 x 69 in. 71

10-1/2 x 15-1/2 1386

Summary (cont.)

12 x 18 in. 6

12 x 24 in. 42

14 x 16 in. 71

15-1/2 x 24-1/2 in. 56

16 x 24 in. 170

16 x 30 in. 6

16 x 32 in. 72

16 x 34 in. 92

16 x 42 in. 2

16 x 46 in. 10

20 x 24 in. covers 14

20 x 48 in. frames 7

2.13.2 Inspection

Covers: 403 good -- no significant deterioration, apparently capable of bearing heavy traffic; 570 fair -- some deterioration, loose at rivets or cracks in welds; 948 poor -- corroded, worn thin by traffic, rivets missing, and/or bent.

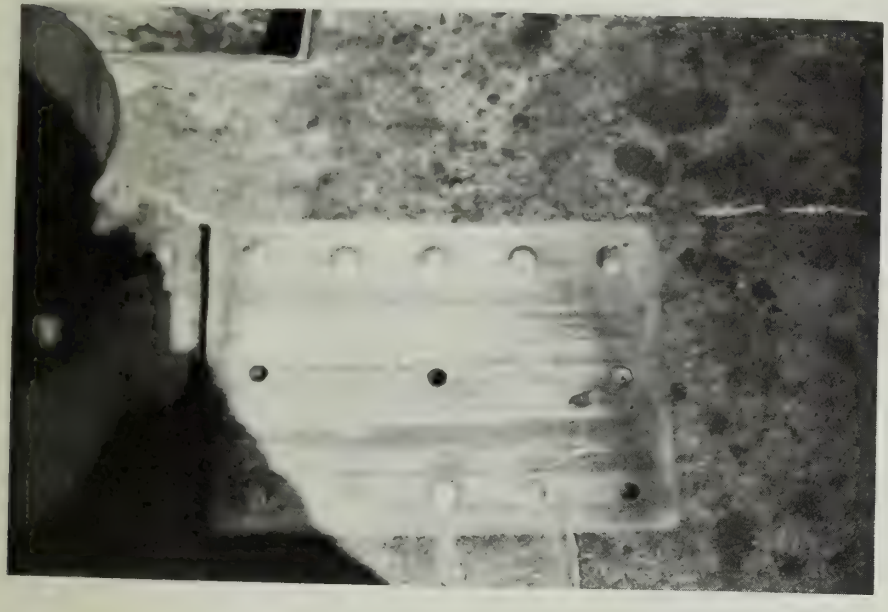
Frames: 418 good -- firmly anchored, solidly constructed, providing good support for cover; 476 fair -- cracked and/or worn by traffic, but providing support for cover; 1027 poor -- loosely anchored, pieces broken loose, considerably worn by traffic.

2.13.3 Evaluation

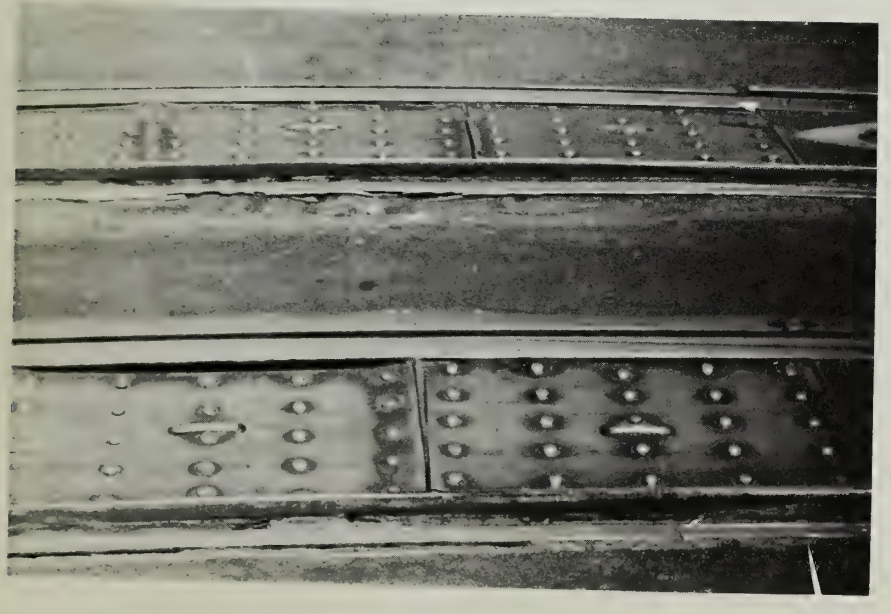
The prevalent bending and warping of the steel and iron hatch covers and misalignment and fracturing of the frames are caused primarily by traffic loading for which the hatches were not designed. Angles used to reinforce metal covers often break under heavy loading. Wood covers swell in wet weather, making them difficult to remove, and they often become so loose in dry weather that they can be dislodged by surface traffic. Weight, lack of hinges, and other design problems of the metal covers make them awkward to handle. Covers at pull curves weigh from about 120 to 235 lbs and therefore are a hindrance to regular inspection because they cannot be lifted by one man. The safety rail and brace used to prop open sheave-pit hatch covers are insecure and therefore unsafe for maintenance personnel, and the hatches are undersized and poorly located for convenient maintenance and replacement of sheaves. The flexibility of depression-beam hatch covers allow traffic loading to bear on the pulleys.

Illustrations

Corroded underside of a riveted pulley hatch cover.



Rivets missing from a pulley hatch cover.



Pull curve hatch covers weighing about 125 lbs; one is warped.

Section 2.14

ELECTRICAL EQUIPMENT

Trackway electrical equipment includes 28 traffic lights, of which 12 have sensors that preempt the signal and/or restore it to its cycle either by a timer or sensor; 9 automatically operated crossbucks; 1 manually operated crossbuck; and strand alarms located at 11 locations. Traffic signals are maintained by the Department of Electricity and other trackway equipment is maintained by Hetch Hetchy Water and Power Department.

2.14.1 Inspection

All traffic lights, sensors, crossbucks, and strand alarms were functioning satisfactorily at the time of inspection.

3.14.2 Evaluation

At the intersection of California and Powell sts the lights are flashing red, instead of having preempts, and consequently insufficient heed is paid to oncoming cable cars, which have the right of way; attempts to time alternate green and red lights efficiently have heretofore been unsuccessful.

At the Columbus to Taylor and Columbus to Mason pull curves, cable cars turn right on green traffic signals into the line of traffic on the lane to the right of the car. Because there is no special light to warn vehicles in the lane that the car is about to turn, the conductor must signal traffic to stop while the car is making its turn.

At Hyde and Beach sts passengers often disembark without regard to vehicular traffic, and vehicles often ignore the flashing red traffic signals at the intersection.

Located only in sheave pits, strand alarms are too far between in many stretches of the trackway. A broken strand should be detected immediately after the break, otherwise it might become caught in a grip and drag the car along uncontrollably, as happened in the 1971 fatal accident.

Section 2.15

Energy

An analysis was made of the energy consumed by the cable car system.

2.2.1 Inspection

Data about energy used were gathered for both the winding machinery and cable reeving. By continuous measurement of the motor speed and secondary currents, the energy delivered at each moment to the cable was determined from morning startup to shutdown. The energy expended by the cable in bending at points of flexure, turning support pulleys, being deformed by-pull curve flat-faced pulleys, moving the cable cars, and accelerating the cars was ascertained from published reference values and field measurements, with an adjustment of these values to reflect the condition of the equipment. A computer program was developed to describe the energy stored in the cable at each point in the system. The program yielded a listing of the cable tension preceding and following each point and showing the amount of energy expended at the point by the cable.

2.2.2 Evaluation

Cable tension ordinarily varies from 12,000 lbs for the incoming cable to 3000 lbs for the outgoing, 9000 lbs being expended in driving the sheaves, pulleys, cable, and

cable cars. Pull curves and other such devices absorb energy that is in part proportional to the cable tensions, and they produce a loss of cable tension that can vary from 200 lbs for a pull curve on the outgoing cable to 800 lbs for one on the incoming cable. By plotting data about cable car position at specific points on the appropriate line, with varying headway schedules, the energy requirements for each headway schedule can be determined. And by relating the effect on energy requirements of the relationship of the location of maximum cable load to the winding machinery, the potential energy savings of rereeving can be determined. For example, the cable tension required to pull a car up the Powell St: grade can be reduced by about 1000 lbs if the cable at this grade proceeds directly to the winding machinery by way of Powell and Washington sts instead of following the present route to Bay and Taylor sts and back to the winding machinery.

Continued analysis will require determination of the routing and extent of each line, the number of cable cars to be assigned to each line and the headway schedule, cable speed, and the design coefficient of any new or modified equipment.

Part 3

Recommendations

Section 3.1

CABLE

Although the cable is not within the scope of work, evaluation is necessary because of its interface with all subsurface trackway equipment. Chin & Hensolt recommends:

- Study of cable that had good wear characteristics in service, to determine its metallurgical and chemical composition, methods of fabrication, heat treatments, cold working during fabrication, and proper specification limits for the finished product.
- Exploration of alternative cable construction; for example, a Seale pattern instead of the current Warrington pattern, with crown wires of a uniform 0.112 in. diameter.
- Reexamination of use of polypropylene fiber core, because it might provide such benefits as less stretching, more uniform cable diameter, and less deterioration resulting from water penetration of the core.
- Investigation of alternative lubricants (including waxes, gear lubricant, and dry lubricants), galvanizing, and elimination of an external lubricant to determine the best method of achieving a satisfactory coefficient of friction with the grip while eliminating the disadvantages of pine tar -- pine tar becomes an adhesive at room temperature and tends

to build up on pulleys and sheaves, increasing drag on the cable; and iron particles worn from the cable, grip, and pulleys become imbedded in the pine tar, acting as an abrasive.

- Investigation of alternative material for grip die, such as nickel titanium, ceramics, beryllium copper, and sulfurized steel, to reduce wear on cable and grip die, optimize the coefficient of friction, and reduce temperatures generated during gripping.

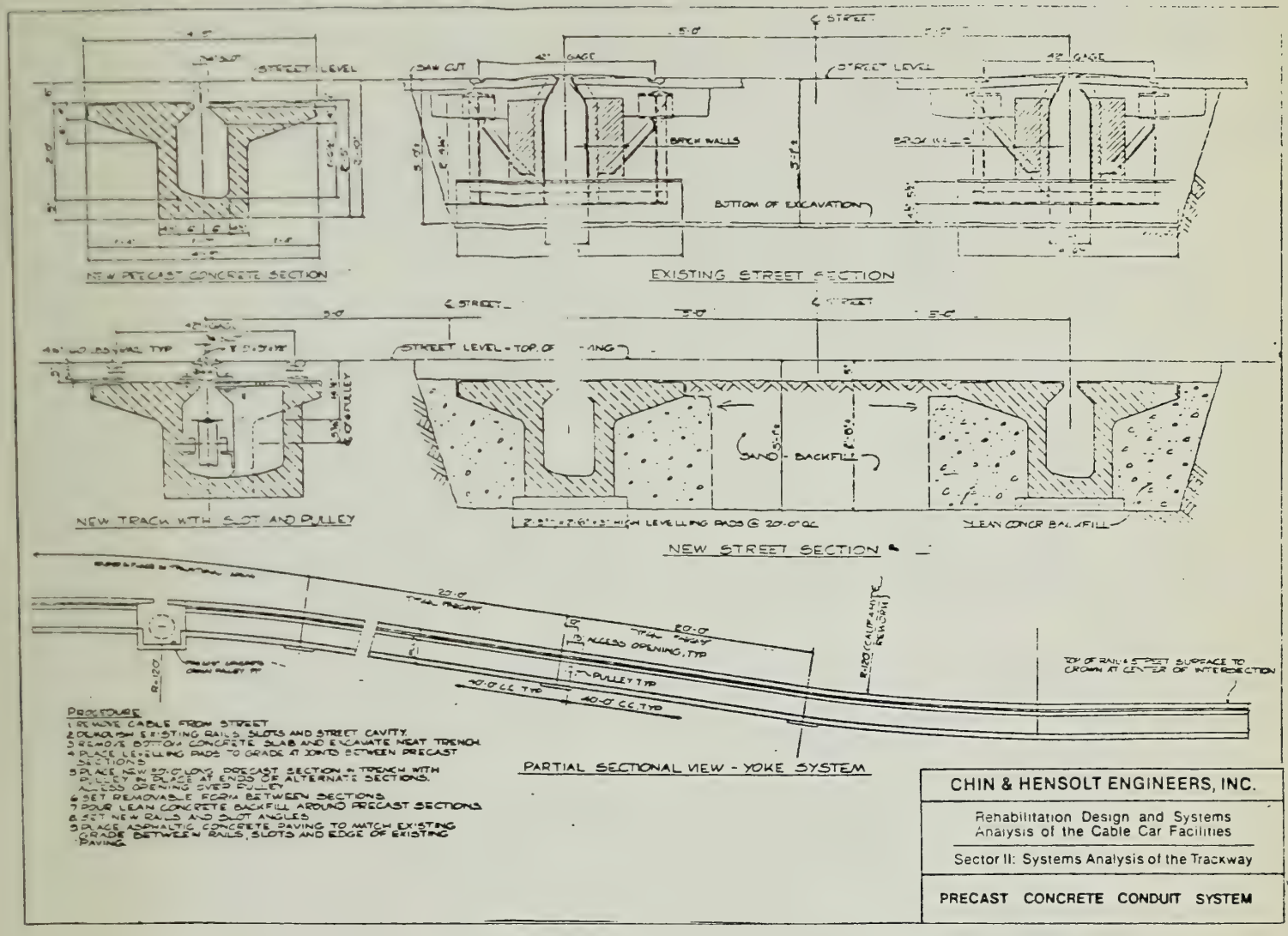
Section 3.2

CONDUIT

A thorough study was made of three alternative methods of rehabilitating the conduits: reinforcement, replacement in kind, and replacement using current construction methods and materials. Reinforcement was found to be economically impractical. Replacement in kind was found to be far more expensive than replacement using modern material and technology. Chin & Hensolt therefore recommends replacement of the present composite metal yoke and concrete and/or brick construction with precast 15- to 20-ft-long sections, except for the nonrevenue track on Hyde St between California and Washington sts, which is used only to transfer cars between the barn and the California line. The new conduits would provide a channel for the cable, support and maintain proper alignment and gauge of running rail and slot rail, and include pulley supports and imbedded placements for pavement guards, which would also act as guard rail. The bottom of the channel would have a sloping V-shaped trough to facilitate drainage and cleaning. Channels containing crown pulleys and depression beams would be standardized and could be assembled in modular fashion for multiple installations (see Figure 3.2.a). Transition sections would be poured in place. The conduit would have a closed top except for hatches, so that after installation of the sections in the street and before installation of the rail and hardware the

street could be opened to traffic. The channel would be drained at approximately 400 ft centers and provided with sand traps and "P" traps. The conduit would be dimensionally stable and structurally capable of supporting H20 loading. It would be designed to fit in the envelope of the present conduit to minimize interference with present utilities, and would conform to San Francisco official grades. A raceway for electrical equipment would be installed with the conduit.

Figures


NEW PRECAST CONCRETE SECTION
EXISTING STREET SECTION
NEW TRACK WITH SLOT AND PULLEY
NEW STREET SECTION
PARTIAL SECTIONAL VIEW - YOKE SYSTEM
PROCEDURE
1 REMOVE CABLE FROM STREET
2 DEMOLISH EXISTING RAILS, SLOTS AND STREET CAVITY.
3 REMOVE BOTTOM CONCRETE SLAB AND EXCAVATE NEAT TRENCH
4 PLACE LEVELLING PADS TO GRADE AT JOINTS BETWEEN PRECAST SECTIONS
5 PLACE NEW 20'-0" LONG PRECAST SECTION IN TRENCH WITH PULLEY IN PLACE AT ENDS OF ALTERNATE SECTIONS. ALIGN OPENING OVER PULLEY
6 SET REMOVABLE FORM BETWEEN SECTIONS
7 POUR LEAN CONCRETE BACKFILL AROUND PRECAST SECTIONS
8 SET NEW RAILS AND SLOT ANGLES
9 PLACE ASPHALTIC CONCRETE PAVING TO MATCH EXISTING GRADE BETWEEN RAILS, SLOTS AND EDGE OF EXISTING PAVING

CHIN & HENSOLT ENGINEERS, INC.

Rehabilitation Design and Systems Analysis of the Cable Car Facilities

Sector II: Systems Analysis of the Trackway

PRECAST CONCRETE CONDUIT SYSTEM

FIGURE 3.2.a

Section 3.3

SHEAVE AND TURNTABLE PITS

Recommendations include:

California and Drumm Sheave Pit

Replacement with concrete construction, including removable roof section for replacement or maintenance of sheave and an anteroom to hold sump pump and provide safe access down a ship's ladder for inspection of the machinery area.

California and Mason, California and Hyde, California and Van Ness, Hyde and Pacific, Hyde and Beach Sheave Pits

Construction of new roof with larger hatches, and addition of anteroom for sump pump easier access.

Bay and Taylor Sheave and Turntable Pits (see Figure 3.3.a)

Replacement, using concrete construction, and relocation 100 ft farther south on Taylor in order to connect the sheave and turntable pits; an underground visitors' gallery could be constructed, at small additional cost, to permit viewing of the workings of the sheave and turntable and provide access by MUNI personnel; and

Taylor St between Bay and Francisco sts could be converted into an attractive landscaped mall with brick pavement and a gazebo.

Powell and Market Sheave and Turntable Pits

Replacement, using concrete construction, with anteroom for sump pump and access to both pits, which would be connected.

Powell and Washington Sheave Pit

Replacement, using concrete construction, with anteroom for sump pump and easy access; cleaning and pointing of tunnel to barn; and installation of proper cable supports.

Also recommended for all pits are:

- o Installation of adequate lighting and electrical outlets.
- o Installation of sand traps at drainage sumps, which should be located for easy access and cleaning.
- o Installation of high-water-level alarm annunciated at cable machinery room.

(For locations of pits, by recommendations, see Figure 3.3.b.)

Figures

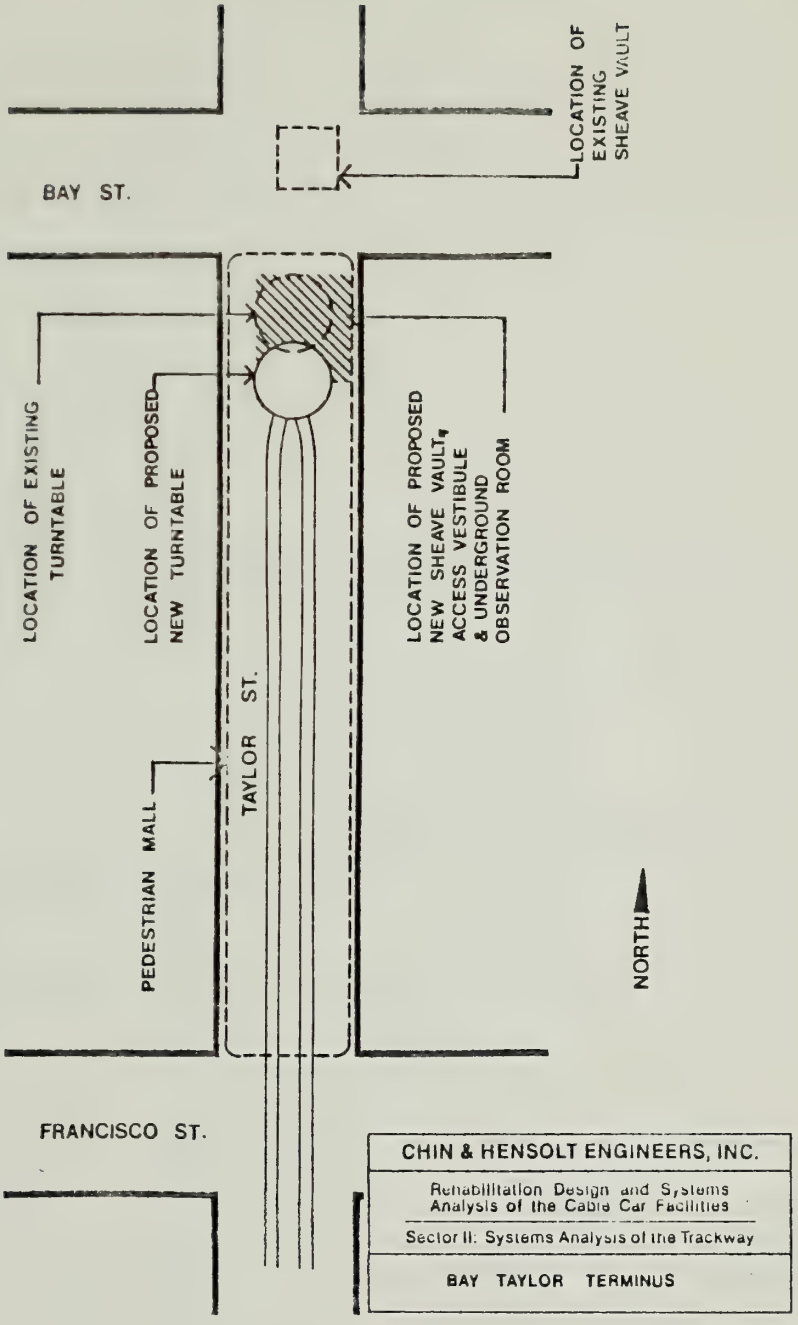

LOCATION OF EXISTING SHEAVE VAULT
BAY ST.
LOCATION OF EXISTING TURNTABLE
LOCATION OF PROPOSED NEW TURNTABLE
TAYLOR ST.
LOCATION OF PROPOSED NEW SHEAVE VAULT, ACCESS VESTIBULE & UNDERGROUND OBSERVATION ROOM
PEDESTRIAN MALL
NORTH
FRANCISCO ST.
CHIN & HENSOLT ENGINEERS, INC.
Rehabilitation Design and Systems Analysis of the Cable Car Facilities
Sector II: Systems Analysis of the Trackway
BAY TAYLOR TERMINUS

FIGURE 3.3.a

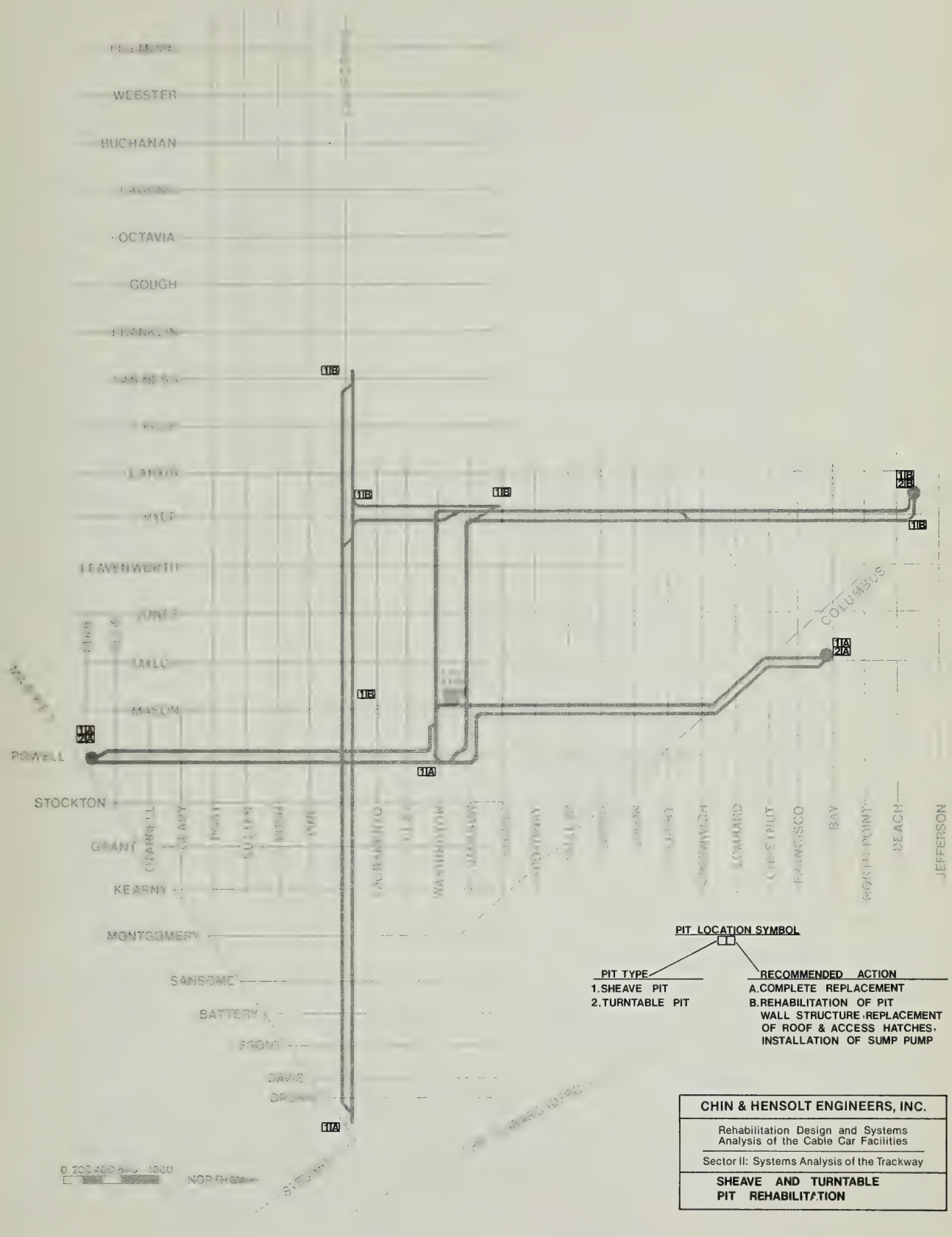

WEBSTER
BUCHANAN
OCTAVIA
GOUGH
LEAVENWORTH
JONES
TAYLOR
MASON
POWELL
STOCKTON
GRANT
KEARNY
MONTGOMERY
SANSOME
BATTERY
FRONT
DAVIS
COLUMBUS
1B
1A
2A
2B
PIT LOCATION SYMBOL
PIT TYPE
1.SHEAVE PIT
2.TURNTABLE PIT
RECOMMENDED ACTION
A.COMPLETE REPLACEMENT
B.REHABILITATION OF PIT WALL STRUCTURE,REPLACEMENT OF ROOF & ACCESS HATCHES, INSTALLATION OF SUMP PUMP
CHIN & HENSOLT ENGINEERS, INC.
Rehabilitation Design and Systems Analysis of the Cable Car Facilities
Sector II: Systems Analysis of the Trackway
SHEAVE AND TURNTABLE PIT REHABILITATION

FIGURE 3.3.b

Section 3.4

PULLEYS

3.4.1 Sheaves (12, 10, 8 ft)

Recommendations include:

- Standardization of material, using fabricated steel instead of iron or cast steel, for quality control and cost effectiveness.
- Standardization of construction, using segmented spider (two sections) and rim (four sections), to facilitiate installation and maintenance.
- Application of lagging to rim, using same material as winder lagging.
- Installation of temperature monitoring device tied into centralized monitoring system.
- Standardization of bearings, using an antifriction roller type (such as Timken or spherical roller), sealed but capable of relubrication, and adoption of automatic lubrication system.

3.4.2 Horizontal Sheave

Recommendations include:

- Retention of current design, except use of machined rope groove.
- Standardization of bearings, using antifriction roller type, sealed but capable of relubrication.

3.4.3 Crowns

Recommendations include:

- o Standardization of material, using cast steel.
- o Standardization of diameter, using fewest possible different sizes in accordance with grade configuration requirements.
- o Standardization of bearings, using antifriction roller type mounted on pillow blocks.

3.4.4 Carrying Pulleys

- o Standardization, using Pacific Av type, with 9-1/2 in. diameter, 4 in. flange face, cast steel material (because it can be repaired by welding), and permanently lubricated antifriction roller bearings.
- o Provision of positive means of support centered below rope.
- o Investigation of feasibility of using
  - (1) Hardened cast steel rims;
  - (2) Cast-on facings to be applied on cast aluminum hub;
  - (3) Tire pressed on cast steel, aluminum, or non-metallic hub;
  - (4) Hexagonal shafts and bearings with hexagonal bores, with compatible components, to simplify servicing and replacement of pulleys; and
  - (5) Shelf-item bearings designed for dirty environments.

Section 3.5

DEPRESSION BEAMS

Because the present depression beams cross the slot and therefore are inherently unsafe, a concerted effort should be made to find another method of depressing the cable -- for example, by using fixed hold-down pulleys and offsetting the track to enable the grip to engage the cable diagonally. If an acceptable method cannot be found, a new beam should be designed that operates freely without requiring rigorous maintenance, resolves imposed loads (whether H20 or cable) into direct stress at its support points, and limits the effects of cyclical loading.

In the meantime, the present beams can be improved by the following measures:

3.5.1 Powell Type

- Eliminate all wood construction, replacing it with steel, as in the 1974 experimental modification of the Powell beam.
- Modify to conform with pulley-support method of 1974 experimental modification of the Powell beam.
- Install renewable rear-support-pin bronze bushings in the beam and support brackets mounted in the street; the pin bushings should be replaced each time a pulley is replaced, to ensure a snug fit.

- o Check beam against jig to ensure proper alignment before a beam that has been removed from the street for servicing is reinstalled.

3.6.2 Hyde Type

Modify to conform with construction and pulley-support method of 1974 experimental modified Powell beam, and redesign attachment of arm to vertical leg.

Section 3.6

RAIL

Each track component should be standardized, and the flange of the cable car wheel should be at least 5/8 in. deep. Other recommendations are:

3.6.1 Running Rail

- Use of Trilby (girder) rail throughout system, or -- if Trilby not available -- 60 lb Tee with a pavement guard at least 3/4 in. thick.
- Thermit weld rail sections, per A.R.E.A.
- Eliminate all three rail systems, replacing them with two adjacent conduits.

3.6.2 Slot Rail

- Use 40-lb slot rail throughout system, or -- if 40-lb slot not available -- angle iron.
- Weld section butts or bevel in direction of travel.
- Redesign to eliminate or reduce damaging effects of emergency slot brake.

3.6.3 Turnouts and Crossovers

- Replace present turnouts with units of more standard design.
- Redesign curvatures with radii as broad as adjacent track layouts permit.
- Use cast manganese steel in switches, mates, and frogs, and construct them with end connections that

permit removal from track without disturbing rest of turnout; manganese steel castings are recommended because the material lends itself to welding repairs in the track, and because it restricts the growth of cracks that occur with advancing age to a slow development instead of the sudden rupture typical of other materials.

- o Design mates and frogs with flange-bearing flangeways.
- o Design all components in accordance as much as possible with accepted street railway practice, although they need not be as heavy.
- o Design switch tongue with grooves and a flangeway proportional to flange bearing of passing car.
- o Ensure conformity of all material and workmanship with A.R.E.A. Specifications for Special Trackwork, Appendix A -- latest revision -- modified where necessary for unique nature of turnouts.

Section 3.7

PAVEMENT

To facilitate replacement of running rail and slot rail, adjacent pavement should be asphaltic concrete, except in brick malls. Materials commonly used for street pavement adjacent to right of way are suitable for the strip between the tracks. Pavement and track should be set to San Francisco official grade.

Section 3.8

PULL CURVES

As many pull curves as possible should be eliminated from the system to reduce the energy loss and safety hazards resulting from the great difficulty the car has in slowing down on the curves. Specific recommendations include:

- Standardization of radii of inside track and outside track, with a minimum of 50 ft for the latter if possible.
- Standardization of all pulley-mounting frames; improvement of frames by redesigning pin, bushing, and other components for dynamic as well as static loading.
- Use of tapered roller antifriction bearings for pulleys, and installation of automatic lubrication system, with temperature monitoring tied into monitoring system centralized in cable machinery room.
- Replacement of present chafing bar with Tee rail, to eliminate fatigue effect of bolting or welding bar to yoke.
- Investigation of possibility of using Teflon facing on grip sand plate, which rubs against bar.
- Investigation of possibility of facing pulleys with polymer.

Section 3.9

BUMPER BARS

The existing bumper bars should be retained at the Powell-California and Mason-Jackson cable crossings, where they serve their original function of protecting the superior cable. Elsewhere, limiting switches that would automatically shut off the winding machinery should be substituted for the bars (for proposed location of bumper bars and limiting switches see Figure 3.9.a). The switches would be of similar design to the strand alarms and would serve as strand alarms as well as limiting switches.

Since the cable continues to travel about 80 ft when the power is shut off, the switches should be placed about 100 ft before the let-go point.

Figures

F39e

Section 3.10

TAKE-ROPE GYPSIES

The take-rope gypsies at California and Hyde and California and Drumm sts should be retained, but those at Bay and Taylor sts and on Hyde St between Washington and Jackson and Jackson and Pacific sts should be replaced with dips.

Section 3.11

SAFETY LATCHES

Use of the present safety latch should be continued.

Section 3.12

TURNTABLES

Since reconstruction required to overcome the defect of the existing tables affords no significant economic advantage over replacement, we recommend installation of new turntables with:

- Table surface of larger diameter to facilitate positioning of car.
- Double tracking to improve car headway.
- Rails closer to rim to preclude bending of frame due to impact of car entering table.
- Deck with surface that matches adjacent pavement.
- Powered rotation, with manual redundancy.

Section 3.13

HATCHES

Recommendations for the hatches include:

- Restrict weight to be lifted by one man to 50 lb.
- Use grating for hatch covers placed above equipment, to facilitate and help assure inspection of equipment.
- Design covers so that they cannot be dislodged by traffic and (where feasible) will remain open when opened.
- Design single covers for hatches over 42 in. crown pulleys and otner equipment of similar size, and place small hatch with grating in cover to facilitate inspection and lubrication; covers should be designed for removal with a hoist placed on a wrecker for major servicing or replacement of pulleys.
- Provide man-hatches leading to ship's ladder in sheave pits with hinges, counterweights, and locking devices, so that cover can be easily opened and securely retained in an open position.

Section 3.14

ELECTRICAL EQUIPMENT

Recommendations include installation of:

- o More strand alarms, placing one about every 2000 ft.
- o Centralized system to monitor bearing temperature, sump pumps in sheave pits, winding machinery motor and gear box temperatures, and gear box oil level.
- o Safety interlock switch for sheave-pit hatch covers.
- o Adequate lighting, 120 volt receptacles, and telephone in the sheave pits.
- o Mini-computer, with a high speed teleprinter, which would be used to record any abnormal conditions in the trackway; control lighting, heating, and ventilation systems for energy conservation; monitor arrival and departure of cars, position of cars in system, and maintenance of equipment.
- o Automatic lubrication system for bearings and chafing bars, using the computer to vary the lubrication interval as the weather changes.

See Attachment 3.14.A.

Attachment 3.14.A

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594 HOWARD STREET, SAN FRANCISCO, CALIFORNIA 94105 (415) 362-3724
CONSULTING ELECTRICAL ENGINEERS - ENERGY MANAGEMENT

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CONSULTING ENGINEERS

ANALYSIS OF ELECTRICAL SYSTEM FOR SAN FRANCISCO CABLE CAR TRACKWAY

The scope of this report includes all the electrical devices used on the track system, on the cable system and the safety or supervisory equipment on the cable machinery.

EXISTING CONDITIONS

A. Summary

The electrical components of the cable and track system consist of:

1. Traffic signals with preempt by cable cars nearing the intersection.
2. Traffic signals without preempt by cable cars.
3. Crossbuck signals (traffic lights for cable car gripmen) controlled by sensors in the cable slot or on the turntables.
4. Crossbuck signals controlled by an employee in a signal house at Powell-California intersection.
5. Strand alarms to shut the system down if a strand breaks on one of the cables.
6. Safety switches on gates to fenced areas in sheave room below Washington-Mason intersection.
7. Temperature sensors on cable machinery bearings.
8. Splice locating equipment.

B. Traffic Signals

Traffic signals are maintained by the Department of Electricity with Hetch-Hetchy maintaining the electrical equipment in the track. The majority of traffic lights cycle in the normal manner; when a cable car is approaching the intersection it passes a "preempt" sensor that causes the traffic signal to advance to a green light for the cable car and a red light for cross traffic. Traffic signals remain green until cable car has passed a "restore" sensor.

A few of the traffic signals have a "preempt" sensor to give the cable car a green light but the control goes back to the timer after a time delay.

Some traffic signals have "preempt" control in only one direction, other traffic signals have no "preempt" and cable cars have to wait for a green light with normal traffic.

C. Crossbuck Signals

Crossbuck signals are red and green traffic lights in the shape of a cross. They have signs that note that they are for cable car use only. Crossbuck signals are placed where cable cars cross each other, where they merge and at turntables.

D. Traffic and Crossbuck Sensors

Preempt and restore devices are magnetic switches mounted just below the roadway to one side of the slot. The steel angles that form the slot have been removed on both sides of the slot and flat plates welded in place to form the slot. (Area opposite magnetic switch must be devoid of steel.) When the grip passes the switch, a magnet inside the switch is attracted to the grip. Magnetic switches are very simple devices with no external moving parts and require very little maintenance. A guide has been mounted below the magnetic switch to keep the grip from touching the switch. Electrical connections and switch maintenance is made in an access box adjacent to the switch.

An earlier method of cable car sensing was an insulated section of rail. One insulated rail section is still in use at the Jackson-Mason intersection. Original insulated rails utilized an insulation material that broke down with time and shorted out when wet.

E. Traffic & Crossbuck Signals by Intersections

1. California at Drumm, Davis, Front, Battery, Sansome, Montgomery, Taylor, Jones, Larkin and Polk Traffic Lights

   No preempt either direction.

2. Kearny-California Traffic Light

   Preempt inbound (CA635)*, time restore.
   No preempt outbound.

3. Grant-California Traffic Light

   Preempt inbound (CA777), switch restore (CA685).
   Preempt outbound (CA630), switch restore (CA704).

*The identification number for each sensor identifies the street and the approximate mailing address.

4. Powell-California Crossbuck Lights & Traffic Lights

Manual operation of crossbucks by signalman in signal house. California Street has the superior or upper cable. Powell Street cars have to coast thru intersection. Intersection has traffic lights for automobiles that operate in a 4 way red flasher mode only.

5. Mason-California Traffic Light

Preempt outbound (CA910), switch restore (CA1000).
No preempt inbound.
Outbound cable cars climb a steep hill, have a let go at crest and coast thru intersection.

6. Leavenworth-California Traffic Light

Preempt inbound (CA1373), time restore.
No preempt outbound.

7. Hyde-California Traffic Light

Preempt inbound (CA1475), time restore.
Prrempt outbound (CA1370), time restore.
Outbound cars have a "let go" and coast thru intersection. Normal operation is for cable cars to run on California Street inbound and outbound. At end of day cable cars turn onto Hyde Street to return to barn. Because of cable car switching it is not practical to have a restore switch.

8. Beach-Hyde and Aquatic Park Traffic and Crossbuck Lights

Crossbuck light indicates to gripman position of turntable. After outbound cable car enters intersection, a preempt sensor (HY2788) holds traffic light on green, changes a pedestrian sign to "Wait" and energizes a sign facing uphill traffic on Hyde Street at cable car entrance to Aquatic Park. Sign has red flashing lights and illuminated letters displaying; "STOP-CABLE CAR TURNING."

Inbound cable car loads passengers then moves forward to sensor (HY2853) which preempts traffic light, energizes illuminated sign and changes pedestrian sign to "Wait." Cable car rounds pull curve then passes restore sensor at end of pull curve. Restore turns off sign and restores pedestrian signs to "Walk." Traffic light restores after cable car clears intersection.

9. Hyde-Northpoint Traffic Light

No preempt either direction.

10. Hyde-Bay Traffic Light

Preempt inbound (HY2643), switch restore (HY2573).
Preempt outbound (HY2546), switch restore (HY2600).
Outbound cable cars wait at Chestnut Street for a green crossbuck light. If cars leave on green signal, they will arrive at Bay Street in syncronization with normal traffic light cycle. (Because of heavy traffic on Bay Street this is an important consideration.) Two sensors (HY2438 and HY2460) will give an immediate green light if outbound cable car is going down hill at more than cable speed. If an inbound cable car has to stop before it reaches Chestnut Street, it has to back down to Bay Street. Two sensors (HY2547 and HY2547) sense a car backing down and preempt traffic signal.

11. Hyde-Pacific Traffic Light

Preempt inbound (HY1637), time restore.
No preempt outbound.

12. Washington-Mason Crossbuck

Hyde cars merge with Powell-Mason cars at this intersection. Cars inbound down Washington Street trip a sensor (WA1187) which gives a red crossbuck signal to cars inbound on Mason. As cars inbound down Washington Street, they enter the intersection and trip a sensor (WA1105) to return the crossbuck light to green.

At the present time cable cars leaving the barn and going down Washington Street do not pass a sensor. These cars must stop prior to entering the intersection as the crossbuck light does not indicate that these cars are coming down the hill.

Cable cars inbound on Mason Street pass a sensor (MA1222) that energizes a sign facing northbound automobile traffic on Mason Street. Sign has flashing red lights and illuminated letters displaying "STOP-CABLE CAR TURNING." Restore sensor (WA1060) is placed at crosswalk.

13. Jackson-Mason Crossbuck

This is one of the two places where the cable cars cross. The Mason cable is the superior (upper) cable. Outbound cars moving up Jackson Street have a "let go" where they enter the intersection, then they coast thru the intersection. A sensor on Jackson Street, half a block from the intersection, turns a crossbuck light for inbound Mason Street cable cars to red. As the cable car enters the intersection an insulated rail returns the crossbuck light to green. It is important that no Mason Street cable car be near the intersection when a Hyde car comes up Jackson Street or it will raise the Powell-Mason cable too high, thereby causing the Hyde car's grip to cut the Powell cable.

14. Pacific-Mason Traffic Light

Preempt inbound (MA1463), switch restore (MA1377).
No preempt outbound.

15. Columbus-Mason Traffic Light with Crossbuck

No preempt or restore devices.
Traffic light is green for Columbus auto traffic, then Crossbuck (for inbound cable cars turning right), then traffic on Mason Street including outbound cable cars.

16. Powell-Pine Traffic Light

Preempt inbound (P0721), switch restore (P0861).
Preempt outbound (P0644), switch restore (P0708).

17. Powell-Bush Traffic Light

Preempt inbound (P0637), switch restore (P0585).
Preempt outbound (P0546), switch restore (P0604).

18. Powell-Sutter Traffic Light with Crossbuck

Preempt inbound (P0555), time restore.
No preempt outbound.

Signals are timed to operate in sequence by the outbound cable car stopping a prescribed time at Pine and Bush intersections and using the Sutter Street crossbuck at beginning of sequence.

19. Powell at Post, Geary and O'Farrell Traffic Lights

No preempt either direction.

20. Powell at Ellis Traffic Light with Crossbuck

No preempt either direction.
Automobile traffic southbound on Powell has a must turn right light, cable cars have a crossbuck to continue toward turntable.

21. Crossbuck Lights at Turntables

All turntables have crossbuck lights controlled by limit switches built into the turntables. These lights indicate to the gripman that the turntable has been rotated into a position to receive a cable car.

F. Strand Alarms

Strand alarms are "U" shaped frames mounted on electrical switches that pivot when broken strands or debris on the cable brush against the frame. The cable consists of 6 strands, spiral wrapped around a sizal rope core. Each strand is in turn made up of 19 wires. The overall diameter of the cable is 1 1/4 inches.

Strand alarms are spaced approximately 1 1/2 inches clear from the cable and are not usually tripped by individual broken wires. Strand alarms formerly had wires between the forks to totally encircle the cable. This technique has been found to be unnecessary. At the present time, the strand alarm encircles only two thirds of the cable.

Existing strand alarms are located where the cable is steady and no cable car grips grip the cable.

Strand alarms are the most important safety devices in the cable system. When a strand alarm trips, the machinery is automatically stopped and an annunciator light indicates which strand alarm has tripped. A truck is dispatched to inspect the cable. Service is not restored until the inspector has inspected the cable, found it safe to use and radioed back approval to restart the machinery.

Wiring between strand alarms and barn (other than the strand alarms at the barn) are by the public telephone system.

Locations of strand alarms are as follows:

1. California Cable

   Hyde and California.
   California at Drumm.
   Prior to cable entering barn.

2. Powell-Mason Cable

   Powell at California where cable goes under California cable.
   Powell at Ellis.
   Powell at Market turntable.
   Powell at Washington.
   Taylor and Bay turntable.
   Prior to cable entering barn.

3. Hyde Cable

   Hyde and Beach turntable.
   Prior to cable entering barn.

G. Safety Gates

Under the Washington-Mason intersection are sheaves for all three cables. These sheave rooms are accessible from the barn via a stairway. Chain link fences have been installed that allow employees to inspect the sheaves and equipment by looking through the fences. Three gates have been installed in the fences and have magnetic switches mounted on them that shut down the machinery if a gate is opened. Switches are wired to an annunciator in the barn.

H. Bearing Temperature Sensors

Temperature sensors mounted on the machinery bearings are wired to a control panel which senses each bearing temperature in sequence. If the temperature is above a preset temperature, an alarm will sound.

I. Splice Locating Equipment

The weakest part of the cable is the splice. It is important to know where the splices are in the system. Two methods of locating splices are used. The oldest method is for the cable splicer to watch for the splices as they pass thru the barn, then note the time.

The time it takes for the cables to run thru the system is as follows:

Hyde cable - 18 minutes, 16 seconds
Powell-Mason cable - 20 minutes, 39 seconds
California cable - 24 minutes, 51 seconds

The newest method of locating splices is to magnetize the cable 50 ft ahead of the splice. The magnetized cable operates a sensor located in the cable sheave rooms under the street outside the barn. The sensor rings a bell, turns on an indication light and resets a clock to 0 time. The cable mechanic hears the bell, observes the light to determine which cable splice is approaching, then inspects the splice. The clocks indicate the time since a splice left the barn. The clocks stop (via an interlock on the main drive motor starters) when the cables stop. At that time the engineer can compare the time clock with a time noted on a system map and know exactly where each splice is.

Cable is magnetized by taking a large permanent magnet and rotating the magnet around the cable 5 times. The magnet is moved 18 inches along the cable, then rotated 5 more times. This is done a total of 9 times.

EVALUATION

A. Traffic Signals and Crossbucks

Traffic signals and crossbucks are in general operating satisfactorily. However, automobile traffic in the vicinity of cable cars is increasing and more traffic lights, signs and other devices should be installed for passenger safety.

The Hyde-Beach-Aquatic Park intersection has a fairly complicated signal system, however, this is one intersection that still gives concern to gripmen. When an outbound cable car arrives at Beach Street, the passengers disembark without regard for traffic lights or passing automobiles. Cars still ignore the sign with flashing lights and move into the path of cable cars turning into the park.

The California-Powell intersection has traffic lights that are never used except as flashing red lights. Muni has tried several times to operate these lights automatically and has not succeeded.

Cable cars inbound at Columbus-Mason and outbound at Columbus-Taylor make right turns from center lanes. Double red flashing lights with signs directing automobile traffic not to pass the cable cars should be installed at these intersections.

B. Strand Alarms

As soon as a strand breaks, the cable should be stopped. If the cable keeps moving, the broken strand unwinds and bunches. The bunch can damage equipment and can snag a cable car's grip. It is important that additional strand alarms be installed so the maximum spacing between strand alarms is 2000 feet.

Many of the additional alarms will have to be designed with an upright fork so the cable can be lifted up from between the tangs by the grip as it passes above the strand alarm. Pulley would have to be carefully placed so grips do not cause nuisance tripping.

C. Safety Switches on Access Gates and Hatches

Fences and safety switches have been placed carefully in the sheave rooms under the Washington-Mason intersection. Employees are able to safely walk thru most of the area and inspect the equipment. When one or more cables are out of service, their individual gate can be opened and employees can work on that cable in safety.

Sheave pits and turntable pits do not have safety switches on their access hatches. Safety switches should be installed at all hatches.

D. Temperature Sensors

Temperature sensors are only installed on bearings in the barn.

Monitoring bearing temperatures is a good way to monitor bearing condition. Bearings on tail sheaves and bend sheaves under the streets are not monitored. When one of these bearings binds the result can cause increased wear on cable and overload the main drive motor. Temperature sensors should be installed on these sheaves.

E. Splice Locating System

It is important that the location of the splices be known whenever the system is stopped by a strand alarm. It is also important that the cable mechanics observe the splice as it passes thru the barn.

Each night after the last car comes back to the barn, the cable mechanics examine each splice.

The system was designed and installed by NASA and is still being refined by NASA. NASA is working with Muni on the installation of sensors in the cable car grips that would sense the magnetized cable and ring a bell to indicate to the gripman that a splice is coming and not to grip the splice.

The following deficiencies were noted as this report was being written (NASA is still improving the system):

1. Often there is no time to magnetize the cable during the shutdown time after a new cable is installed.

2. Synchronization of the time clocks with respect to splice location is lost whenever the system is operated at reduce speed (40 - 50%).

3. Cables have to be remagnetized twice a week. The California cable holds its magnetism very well, the Hyde cable holds its magnetism fairly well, but the Powell-Mason does not hold its magnetism.

F. Bumper Bars

At the present time if a gripman does not "let go" of the cable at a "let go", the rising cable lifts a bumper bar which causes a pulley to turn against the cable and a bell rings. If the gripman still fails to "let go", the bumper bar forces the cable out of the grip. Both grip and cable are usually damaged by this action.

G. Sheave Pits

At the present time there are very few electrical devices in the sheave pits. The devices in the sheave pits are as follows:

1. Some have strand alarms that must be reset.

2. Some have lighting in them.

3. One has a sump pump.

RECOMMENDATIONS

A. General

One weakness of the present system is the lack of records of maintenance, breakdowns, shutdowns, loading of system, etc.

B. Additional Safety Devices

To increase the safety and to aid in the maintenance of the system, it is recommended that the following additional supervisory devices be installed:

1. Additional strand alarms.
2. Monitor all bumper bars.
3. Monitor all bearing temperatures.
4. Safety switches at sheave pit hatches.
5. High water alarms and sump pumps in sheave pits.
6. An audible alarm in all sheave pits to indicate that the cable is about to start.
7. Monitor motor temperature.
8. Monitor gearbox temperature.
9. Monitor gearbox oil level.
10. 120 volt receptacles in pits for maintenance.
11. Telephones in pits.
12. Lighting in all pits.

C. Annunciation and Control

The existing annunciators are:

1. 4 drop annunciator for annunciation of safety devices in sheave pit under the Washington-Mason intersection.
2. 8 drop annunciator for strand alarms wired back to the barn via the public telephone system.

The additional devices that should be monitored will require at least 100 drop annunciator.

It is recommended that a mini computer be installed rather than an annunciator because of the flexibility and additional features that a mini computer can perform. It is not intended to have the computer run the cable car system, rather, the computer would aid in the manual operation of the system with only a few automatic subsystems.

The computer would be furnished with a high speed teleprinter to record any abnormal conditions, complete with time, location, etc. Remote terminals can be provided in managerial offices for multi-location observation of track and system conditions. This system could also be used to control lighting, heating and ventilation systems for energy conservation, supervision of arrival and departure times of cars, position of cars on the system and to develop a preventative maintenance program by recording actual operating times of equipment and comparing to recommended maintenance schedules. In addition, a central graphic panel can give a constant visual view of the system or the remote terminals can be provided with capability to give a color display of system conditions. For example, any red colored display would indicate a trouble mode.

D. Raceway System in Trackway

Because of the amount of additional safety devices that should be installed along the trackway, it is recommended that raceway systems be installed parallel to the cable slots as the trackway is rebuilt. One raceway system would be for data gathering, another for voice communication. It is recommended that the public telephone system not be used for supervision of safety devices in track system.

E. Automatic Lube System

An automatic lube system can be installed so all the bearings and chafing bars on the pull curves can be lubricated at a set interval. The computer can vary the interval as the weather changes.

F. Automatic Indication of System Overloading

The electrical load on the main drive is a good indication of the track system maintenance. The computer can monitor a watt-hour meter and mathematically calculate the average daily load.

G. System Emergency Shutdown by Gripman

It is recommended that a wireless system be installed so a gripman, in an emergency, can push a button on the cable car and stop the cable. The signal should be coded so the cable car can be identified. Whether a single receiver can be in the barn or whether receivers should be installed along the track system should be investigated.

H. Communication with Cable Cars

Radios should be installed so a gripman can call for assistance when he has a problem and can not proceed.

1. Traffic Lights

It is recommended that the traffic lights at many of the intersections be completely reevaluated. The number of automobiles in the vicinity of the cable cars in increasing. This creates the need for more complex signal and traffic control systems.

Section 3.15

ENERGY

To conserve and make the most efficient use of energy, we recommend:

- Investigation of reducing current 9.54 mph cable speed to previous California cable line speed of 7 mph, to reduce energy requirement to about 25 percent of present energy requirements.
- Replacement of the California line's Hyde St nonrevenue track -- which is used solely to transfer cars between the barn and California St at the beginning and end of each day's operations -- with a 3000 ft independent loop driven by a satellite power unit that would operate only on demand (salvaged cable could be used), in order to eliminate the equivalent of four 90° bends -- this would reduce the driving force for the California cable by at least 10 percent and extend the life of the California cable (see Figure 3.15.a).
- Rereeving of Powell-Mason line cable to reduce distance between center of load (Powell St grade) and winding machinery and effect an estimated 10 percent reduction in the cable driving force for the Powell-Mason loop (see Figures 3.15.b,c); or study feasibility of dividing Powell and Mason ropes to reduce driving

force by an estimated 20 percent (see Figure 3.15.d); however, this will require use of four cables on winding machinery and the addition of one tension carriage.

- o Study of feasibility of removing as many pull curves as possible; for example, by continuing the line on Mason St from Columbus Av to Fisherman's Wharf.
- o Installation of automatic lubrication system for pulleys and sheaves.

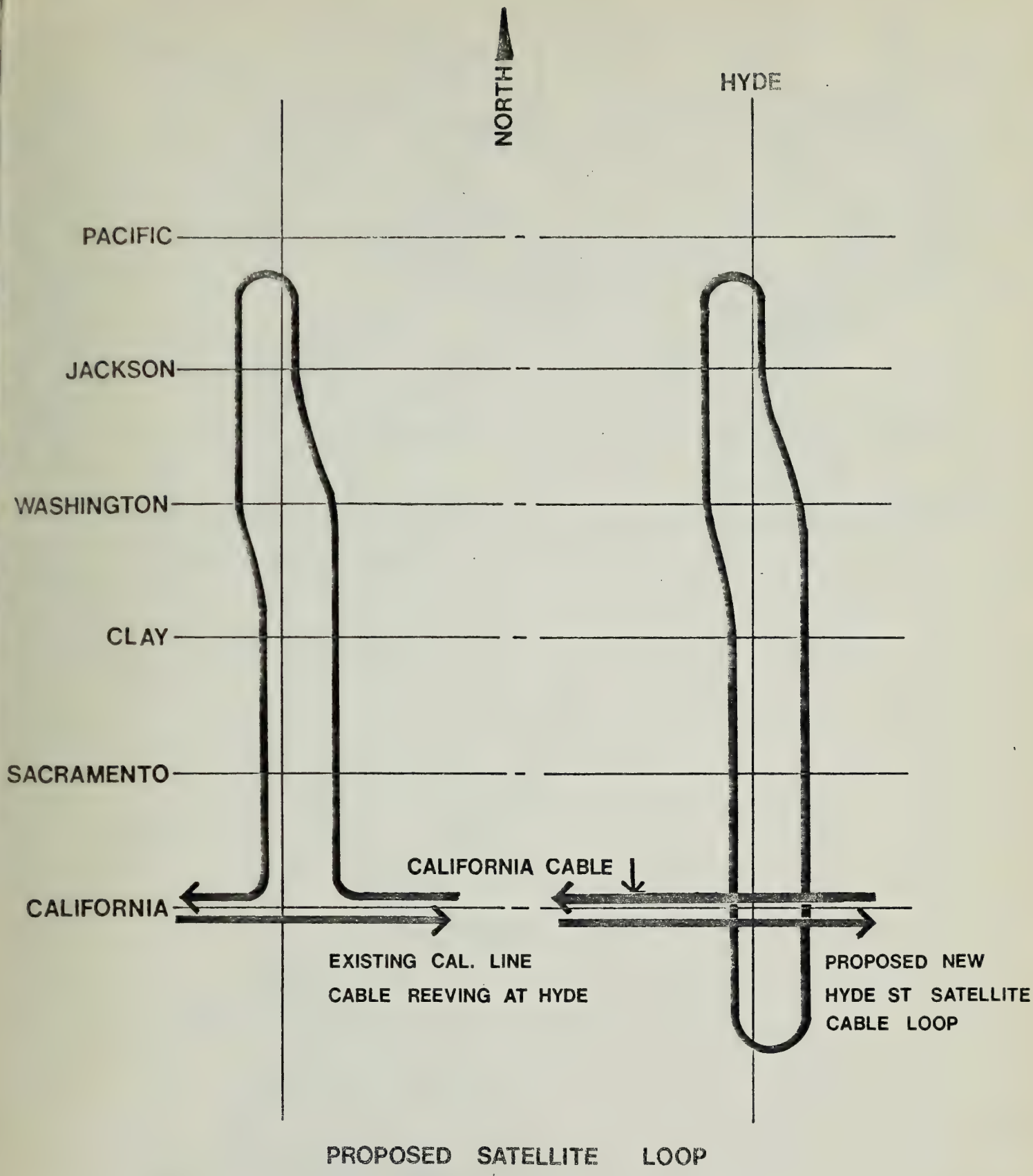
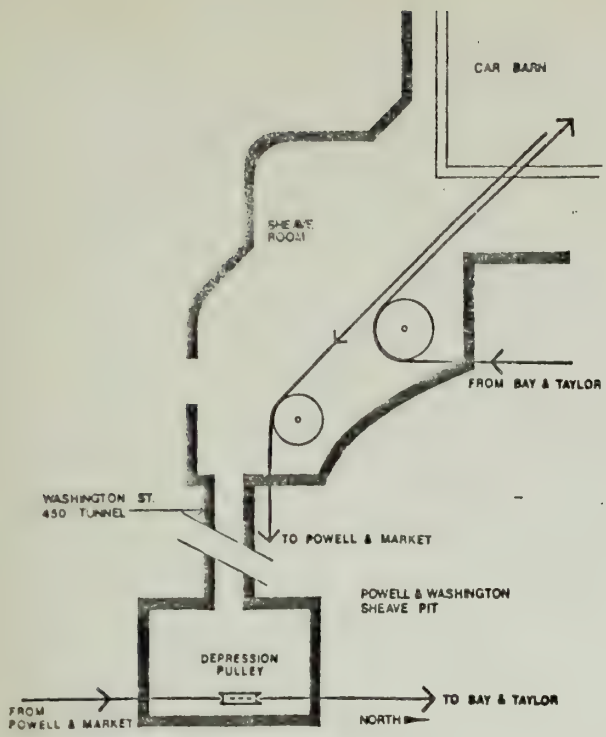
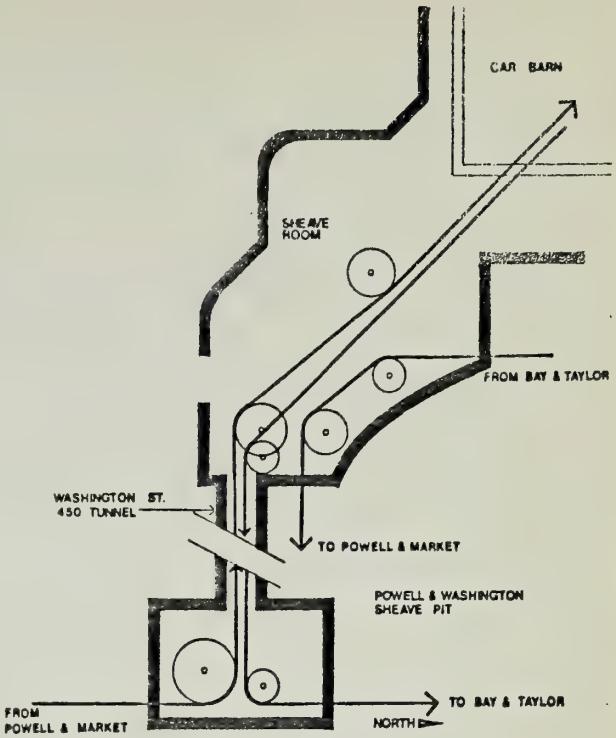

NORTH
HYDE
PACIFIC
JACKSON
WASHINGTON
CLAY
SACRAMENTO
CALIFORNIA
CALIFORNIA CABLE
EXISTING CAL. LINE
CABLE REEVING AT HYDE
PROPOSED NEW
HYDE ST SATELLITE
CABLE LOOP
PROPOSED SATELLITE LOOP

FIGURE 3 15.a



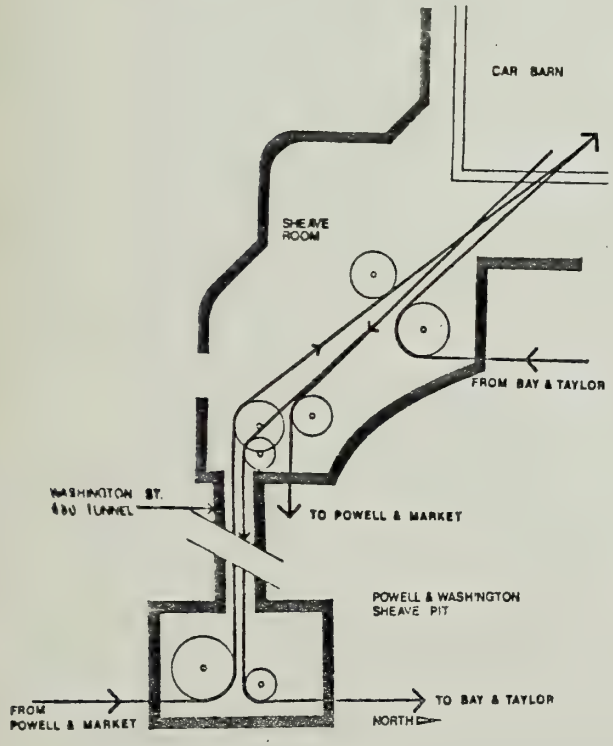
EXISTING POWELL - MASON CABLE REEVING AT WASHINGTON & MASON AND WASHINGTON & POWELL

FIGURE 3.15.b



PROPOSED POWELL-MASON CABLE REEVING SCHEME

FIGURE 3.15.c



INDIVIDUAL POWELL CABLE & MASON CABLE REEVING SCHEME

FIGURE 3.15.d

Figures

Section 3.16

TESTING AND EVALUATION

The decision to introduce modern materials and technology into the cable car system depends on the benefits revealed as a result of testing and evaluation. Materials to be tested and evaluated include:

- o High molecular weight polymers for sheave and pulley lagging and pulley facings, hubs, and bearings.
- o Special alloys for grip dies and wheel rims.
- o Lubricants for the cable, cable/sheave interface, cable/grip interface, and bearings for service in a dirty environment.

Testing and evaluation of products involving polymers, alloys, or lubricants require a team of designers and material specialists working with material manufacturers. The designers will produce drawings and/or specifications, including loading and service environment, for the materials to be tested. The specialist will make a preliminary material selection for evaluation and identify manufacturers of specific materials. The material manufacturer, having intimate knowledge of his product's properties and service range, will be invited to submit products for evaluation under service conditions.

Appendix

On-site Inspection Records

Street: POWELL From: O'FARRELL To: MARKET Inbound: X Outbound

Date 8/[illegible]/[illegible]

Hatch No.	Hatch Cover: Weld, Plyer, CI, Wood	Hatch Cover: Good Fair Poor	Hatch Frame: Good Fair Poor	Pulley Present: Yes No	Pulley Type: Code Letters	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr., Brass/Babb.	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Points: Good Fair Poor	Switch Tongue: Good Fair Poor	Gate Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Bead Frame: Good Fair Poor	Dep. Beam Pulleys: Good Fair Poor	Dep. Beam Anchor Good Fair Poor	Safety Latch Frame: Good Fair Poor	Safety Latch Tongue: Good Fair Poor	Turnable Latch: Good Fair Poor	Gypsy Mechanism: Good Fair Poor	Slot Width: Good Fair Poor (in fraction of in.)	Additional Remarks
PO																														
155	R	P	P	N						G	P	P	G	P															11/16	
143	R	P	F	Y	PA	S	G	BAB	F	P	P	P	G	P															3/4	
133	R	P	P	Y	PA	S	G	BAB	F	P	P	P	G	P															7/8	
121	R	P	P	Y	PA	S	G	BAB	P	P	P	P	G	P															1	
111	R	P	P	Y	PA	S	G	BAB	P	P	P	P	G	P															11/16	Rope Light
101	CI	G	G	N						G	F	F	G	P															11/16	U.R.R.
77	R	P	P	N						G	G	G	P	G															3/4	
75	R	P	P	Y	6 in.	S	F	BAB	P	P	G	G	P	P															3/4	
71	W	G	G	N						G	G	G	G	G															7/8	Bumper Bar
63	W	G	G	Y	2/6	in S/S	G/G	2 AF	G	F	G	G	G	G															3/4	Hold Down
53	R	P	P	Y	PA	S	F	BAB	P	F	G	G	G	G															13/16	
45	R	P	P	Y	6"	S	G	AF	G	F	G	G	G	G															5/8	
37	R	P	P	Y	6"	S	G	AF	G	G	G	G	G	G															11/16	
27	R	P	P	N						G	G	G	G	G															5/8	
19	CI	P	P	Y	G	S	G	AF	G	P	G	G	G	G															11/16	V.R.R.
11	CI	G	G	Y	CR	CI	G	BAB	G	P	G	G	G	G	HEAVY COVER NO PICTURE														3/4	V.R.R.
3																									G				T.T. Latch

Street: POWELL From: POST To: O'FARRELL Inbound: X Outbound

Date 8 / 14/ 78

Hatch No.	Hatch Cover: West / East	Hatch Cover: CI / Steel	Hatch Frame: Good / Fair / Poor	Pulley Present: Yes / No	Pulley Type: Code Letters	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good / Fair / Poor	Pulley Bearings: Anti-Fr. / Brass / Babb.	Pulley Support: Good / Fair / Poor	Channel Condition: Good / Fair / Poor	Outside Rail: Good / Fair / Poor	Inside Rail: Good / Fair / Poor	Slot Rail: Good / Fair / Poor	Pavement Condition: Good / Fair / Poor	Switch Rails: Good / Fair / Poor	Switch Tongue: Good / Fair / Poor	Mate Rails: Good / Fair / Poor	Frog Rails: Good / Fair / Poor	Slot Guides: Good / Fair / Poor	Slot Point: Good / Fair / Poor	Dep. Beam Frame: Good / Fair / Poor	Dep. Beam Pulleys: Good / Fair / Poor	Dep. Beam Anchor Good / Fair / Poor	Safety Latch Frame: Good / Fair / Poor	Safety Latch Tongue: Good / Fair / Poor	Turnable Latch: Good / Fair / Poor	Gypsy Mechanism Good / Fair / Poor	Slot Width: (in fraction of in.)	Additional Remarks
PO																													
381	W/W	G/G	G/G	Y	CR	CI	G	BAB	G	P	P	P	P	F														3/4	20 in.
371	R	P	P	Y	PA	S	F	BAB	P	G	P	P	P	F														3/4	Bearings dry
361	CI	G	G	N						G	P	P	G	F														3/4	U.R.R.
351	R	P	P	Y	PA	S	F	BAB	F	G	P	P	G	F														7/8	
341	R	P	P	P	PA	S	F	BAB	F	G	P	P	P	F														3/4	
331	R	P	P	N						G	P	P	P	P														7/8	
321	R	P	P	Y	Uretha. Alum.		F	AF	F	F	P	P	P	F														7/8	
311	R	P	P	N						G	P	P	P	P														7/8	
299	R	P	P	N						G	P	P	P	P														5/8	
287	R	P	P	N						G	P	P	P	P														11/16	
279	W/W	P/P	P/P	Y	CR	CI	G	BRS	G	P	P	P	P	P														11/16	
269	R	P	P	N						G	P	P	G	P														3/4	
259	W	G	G	Y	PA	S	F	BAB	F	P	P	P	P	P														3/4	
249	R	P	P	N						G	P	P	G	F														11/16	
239	R	P	P	Y	PA	S	G	BAB	F	F	P	P	G	F														5/8	
229	W	P	P	Y	PA	S	G	BAB	F	G	P	P	G	F														3/4	
214	R	P	P	Y	Uretha. Alum.		G	AF	F	F	P	P	G	F														3/4	
209	W	P	P	W						F	P	P	G	F														11/16	
201	R	P	P	N						G	P	P	P	P														3/4	
177	W/W	F/F	F/F	Y	CR	CI	G	BAB	G	P	P	P	P	P														3/4	
165	R	P	F	Y	Alum		G	AF	G	G	P	P	G	P														3/4	

Street: Powell From: BUSH To: POST Inbound: X Outbound

Date 8 / 14 / 78

Hatch No.	Hatch Cover: Steel, Fiber, CI, Wood	Hatch Cover: Good Fair Poor	Hatch Frame: Good Fair Poor	Pulley Present: Yes No	Pulley Type: Rope Letters	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr., Brass/Babb.	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Elev. Rail: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Mate Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Beam Frame: Good Fair Poor	Dep. Beam Pulleys: Good Fair Poor	Dep. Beam Anchor Good Fair Poor	Safety Latch Good Fair Poor	Safety Latch Frame: Good Fair Poor	Turntable Latch Tongue: Good Fair Poor	Gypsy Mechanism: Good Fair Poor	Chain Anchor: Good Fair Poor	Chain Size (in fraction of in.)	Additional Remarks
PO																														
571	R	F	P	Y	Uretha Alum		G	AF	G	F	P	P	G	G															7/18	
561	R	P	P	Y	PA	S	G	BAB	G	G	P	P	G	G															1/2	
555	W	G	G	N						G	P	P	G	E															5/8	
551	R	P	P	Y	PA	S	G	BAB	P	G	P	P	G	F															3/4	
541	R	P	P	N						G	P	P	G	P															3/4	
531	R	P	P	Y	Uretha Alum		G	AF	G	G	P	P	G	P															3/4	
521	R	P	P	N						G	P	P	P	G															7/8	
511	R	P	P	N						G	P	P	P	G															13/16	
503	R/R	P/P	P/P	Y	DB	2/S	G/G	2/AF		G	P	P		P							G	G	P						7/8	
501	R	P	P	N						G	P	P	P	P															1	Rope hitting sla
485	W/R	G/P	P/P	Y	CR	CI	G	BAB	G	P	P	P	P	F															7/8	
477	W	G	G	N						G	P	P		F															7/8	Take out
471	R	P	P	N						G	P	P	G	P															13/16	
461	R	P	P	Y	PA	S	F	BAB	P	P	P	P	G	P															3/4	
451	R	P	P	N						G	P	P	G	P															5/8	
441	R	P	P	N						G	P	P	G	P															11/16	
431	R	P	D	Y	PA	S	F	BAB	P	F	P	P	G	P															3/4	
421	R	P	P	N						G	P	P	G	P															7/16	
411	R	P	P	N						G	P	P	G	P															7/8	
401	R	P	P	N						F	P	P	P	F															11/16	Rope up in slot rail
387	W	G	G	N						G	P	P	P	P															1	

Street: Powell From: Pine To: Bush Inbound: X Outbound

Date 8/14/78

Catch No.	Hatch Cover: Material	Hatch Cover: Condition	Hatch Frame: Condition	Pulley Present:	Pulley Type:	Pulley Material:	Pulley Condition:	Pulley Bearings:	Pulley Support:	Channel Condition:	Outside Rail: Condition	Inside Rail: Condition	Slot Rail: Condition	Pavement Condition:	Switch Rails: Condition	Switch Tongue: Condition	Mate Rails: Condition	Frog Rails: Condition	Slot Guides: Condition	Slot Points: Condition	Dep. Beam Frame: Condition	Dep. Beam Pulleys: Condition	Dep. Beam Anchor Condition	Safety Latch Frame: Condition	Safety Latch Tongue: Condition	Turntable Latch: Condition	Gypsy Mechanism: Condition	Slot Width: (in fraction of in.)	Additional Remarks
	R	P	P	N						G	P	P	G	G														7/8	
	R	P	P	Y	DB	2/S	P/P	2/AF		G	P	P		G						G	P	P						7/8	
		P	P	Y	DB	2/S	G/G	2/AF		P	P	P		F						F	G	F						3/4	
	R	P	P	N						G	P	P	P	P														7/8	
	W	G	G	N						G	P	P	G	F														3/4	Sign Return
	W	F	F	Y	CR	CI	G	BAB	G	P	P	P	G	P														11/16	
	W	F	F	Y	CR	CI	G	BAB	G	P	P	P	G	G														11/16	
	R	P	P	Y	vr	other Alum	G	AF	P	P	P	P	F	G														3/4	
	R	P	P	Y	vr	other Alum	G	AF	F	P	P	P	G	G														3/4	
	R	P	P	Y	PA	S	P	BAB	P	P	P	P	G	G														7/8	Pulley Stopped
	R	P	P	Y	PA	S	G	BAB	F	F	P	P	G	G														3/4	
	W	G	G	N						G	P	P	G	G														1/4	pre-empt
	R	P	P	Y	PA	S	G	BAB	P	G	P	P	F	F														7/8	
	R	P	P	N						G	P	P	G	F														7/8	
	R	P	P	N						G	P	P	P	P														13/16	
	R	P	P	Y	DB	2/S	P/P	2/AF		F	P	P		F						G	P	P						1	
	R	P	P	Y	DB	2/S	G/G	2/AF		G	P	P		F						G	G	P						1	
	R	P	F	N						G	P	P	P	P														3/4	
	W	G	F	N						F	P	P	P	G														5/8	Signal Return
	R	P	F	Y	CR	CI	G	BAB	G	F	P	P	P	G														1/16	
	R	P	F	Y	CR	CI	G	BAB	G	F	P	P	G	G														5/8	

Street: Powell From: Sacramento To: Pine Inbound: X Outbound

Date 8/11/78

Hatch No. PO	Hatch Cover: Weld Frame, CI Weld	Hatch Cover: Cond. Fair Poor	Hatch Frame: Cond. Fair Poor	Pulley Present: Yes No	Pulley Type: Cast Iron, Steel, Alum.	Pulley Material: Cond. Fair Poor	Pulley Condition: Fair Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Cond. Fair Poor	Channel Condition: Cond. Fair Poor	Gutside Rail: Cond. Fair Poor	Inside Rail: Cond. Fair Poor	Slot Rail: Cond. Fair Poor	Pavement Condition: Good Fair Poor	Switch Points: Cond. Fair Poor	Switch Tongue: Cond. Fair Poor	Rate Paths: Cond. Fair Poor	Frog Paths: Cond. Fair Poor	Slot Guides: Cond. Fair Poor	Slot Point: Cond. Fair Poor	Dep. Beam Frame: Cond. Fair Poor	Dep. Beam Pulleys: Cond. Fair Poor	Dep. Beam Archer: Cond. Fair Poor	Safety Latch: Cond. Fair Poor	Safety Latch Frame: Cond. Fair Poor	Safety Latch Tongue: Cond. Fair Poor	Turnbuckle Stretch: Cond. Fair Poor	Gypsy Sections: Cond. Fair Poor	Gypsy Width: Cond. Fair Poor (in fraction of in.)	Additional Remarks
861	R	P	P	N						G	F	F	G	F															11/16	
851	R	P	P	Y	Urethane Alum.		G	AF	G	F	F	F	G	P															3/4	
841	WOOD/ WOOD	G/G	G/G	Y	CR	CI	G	Bab	G	F	F	F	G	P															3/4	20"
831	R	P	P	N						G	G	G	G	P															3/4	
821	R	P	P	Y	PA	S	F	Bab	P	P	G	F	G	G															7/8	
805	W/W	G/G	G/G	Y	CR	CI	G	Bab	G	F	F	F	G	G				CALIFORNIA STREET											13/16	30"
803	R	F	F	N						G	F	F	P	G															5/8	
801	W	F	F	N						G	F	F	P	F															1	
799	W/W	G/G	F/F	Y	CR	CI	G	Brs	G	P	P	F	G	F															7/8	20-in.
797	W/W	W/G	G/F	N						P	P	P	P	F															7/8	Bumper bar
793	W	G	F	Y	PA	S	G	AF	G	G	P	P	P	F															5/8	
787	W/W	G/G	F/F	Y	CR	CI	G	Bab	G	P	P	P	P	P															5/8	30-in.
777	W/W	G/G	F/F	Y	CR	CI	G	Bab	G	P	P	P	P	F															3/4	30-in. Rails welded
773	W/W	G/G	F/F	Y	CR	CI	G	Bab	G	P	P	P	P	G															1	30-in.
765	R	P	P	N						G	P	P	G	G															5/8	
757	R	P	P	Y	PA	S	G	Bab	P	P	P	P	G	F															11/16	
749	R	P	P	N						G	P	P	G	G															3/4	
731	R	P	P	Y	Urethane Alum.		G	AF	G	P	P	P	F	G															13/16	
723	R	P	P	Y	PA	S	G	Bab	G	F	P	P	P	F															3/4	
721	W	G	G	N						F	P	P	P	F															11/16	Pre-empt
715	R	P	F	Y	PA	S	G	Bab	G	G	P	P	G	G															5/8	

Street: Powell From: Washington To: Sacramento Inbound: X Outbound

Date 8/11/78

Hatch No. PO	Hatch Cover: Yield Type	Hatch Cover: Cond.	Hatch Frame: Cond.	Pulley Frame: Cond.	Pulley Present: Yes No	Pulley Type: Fair Poor	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Cond. Fair Poor	Pulley Support: Cond.	Channel Condition: Good Fair Poor	Outside Paint: Cond. Fair Poor	Inside Paint: Cond. Fair Poor	Slot Rails: Cond. Fair Poor	Pavement Condition: Good Fair Poor	Switch Rails: Cond. Fair Poor	Switch Tongue: Cond. Fair Poor	Gate Rails: Cond. Fair Poor	Frog Rails: Cond. Fair Poor	Slot Guides: Cond. Fair Poor	Slot Points: Cond. Fair Poor	Dep. Lever Frame: Cond. Fair Poor	Dep. Lever Pulleys: Cond. Fair Poor	Dep. Lever Anchor: Cond. Fair Poor	Safety Latch: Cond. Fair Poor	Safety Latch Frame: Cond. Fair Poor	Safety Latch Tongue: Cond. Fair Poor	Turnbuckle Latch: Cond. Fair Poor	Clamp Mechanism: Cond. Fair Poor	Slot Width: (in fraction of in.)	Additional Remarks
1065	R	P	P	N						G	G	G	G	F																15/16	
1061	W	F	P	N						G	G	G	G	F																7/8	
1051	W	P	P	N						G	G	G	P	P																5/8	
1041	R	P	P	Y	PA	S	F	Bab	G	P	G	G	P	P																3/4	
1031	R	P	P	Y	Urethane Alum.		F	AF	F	P	G	G	F	P																11/16	
1021	R	P	P	N						G	G	G	G	P																5/8	
1011	R	P	P	Y	PA	S	F	Bab	G	P	G	F	G	P																7/8	
1001	Wood/Wood	G/G	P/P	Y	CR	CI	G	Bab	G	F	G	G	G	P																3/4	36"
995	R	P	P	N						G	G	F	G	F																3/4	
985	R	P	P	N						G	F	F	P	P																5/8	
981	R/R	P/P	P/P	Y	DB	2/S	P/P	2/AF		P	F	F		P								F	P	P						11/16	1 Pulley B.O. bearings.
961	R	P	P	Y	PA	S	G	AF	F	P	F	F	P	P																3/4	
951	R	P	P	N						G	F	F	G	P																3/4	
941	R	P	P	Y	PA	S	G	Bab	G	F	F	F	G	P																11/16	
931	R	P	P	Y	PA	S	F	Bab	F	P	F	F	G	P																3/4	
921	R	P	P	Y	Urethane Alum		G	AF	F	F	F	F	P	G																13/16	
911	R	P	P	Y	PA	S	F	Bab	P	P	F	F	G	P																13/16	
901	Wood/Wood	F/F	F/G	Y	CR	CI	G	Bab	G	F	P	F	G	P																7/8	
891	R	P	P	N						G	P	F	P	P																11/16	
881	R/R	P/P	P/P	Y	DB	2/S	F/F	2/AF		F	P	F		P								G	F	F						7/8	
872	R	P	P	N						G	F	P	G	P																13/16	

Street: POWELL From: WASHINGTON To: JACKSON Inbound: ____ Outbound: X

Date 5 / 18 / 78

| Hatch No. PO | | |

Street: Powell From: Clay To: Washington Inbound: Outbound X

Date 8/15/78

Hatch No.	Hatch Cover: Poor, Fair, Good, Excel.	Hatch Cover: Good, Fair, Poor	Hatch Trace: Good, Fair, Poor	Pulley Present: Yes, No	Pulley Type: Cast, Forged	Pulley Material: Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Ball-Jr., Brass, Bush.	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Guide Rail: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Vale Rails: Good, Fair, Poor	Tree Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Points: Good, Fair, Poor	Dep. Trace: Good, Fair, Poor	Dep. Tens Pulleys: Good, Fair, Poor	Dep. Tree Anchor: Good, Fair, Poor	Safety Latch: Good, Fair, Poor	Safety Latch Trace: Good, Fair, Poor	Safety Latch Tongue: Good, Fair, Poor	Safety Latch Cable: Good, Fair, Poor	Gibby Mechanism: Good, Fair, Poor	Gibby Mechanism: Good, Fair, Poor (to fraction of inch)	Additional Remarks
PO	Good Wood	F/F	G/G	Y	CR	CI	G	Bab	G	F	P	P	G	P																
1002																													1/4	In-in.
1012	R	P	P	Y	PA	S	F	Bab	F	P	P	P	G	P															3/4	
1022	R	P	P	Y	Urethane Alum.		G	AF	G	P	P	P	G	P															1 5/16	
1032	R	P	P	Y	PA	S	P	Bab	G	P	P	P	G	P															3/4	Pulley stopped
1042	R	P	P	Y	PA	S	P	Bab	G	P	P	P	G	P															1 1/16	Pulley stopped
1052	R	P	P	N						G	P	P	G	P															1 1/16	
1060	R	P	P	N						G	P	P	G	P															1 1/16	
1062	R	P	P	N						G	P	P	G	P															1 1/16	
1066	R/R	P/P	P/P	Y	CR	CI	G	Bab	F	G	P	P	G	P															3/4	
1076	R	P	P	N						G	P	P	G	P															3/4	
1086	R	P	P	N						G	P	P	G	P															3/4	

Street: Powell From: California To: Clay Inbound: ____ Outbound X

Date 8/15/78

Hatch No. PO	Hatch Cover: Yes/No Pries. Cl. Fair Poor	Hatch Cover: Cond. Fair Poor	Hatch Frame: Cond. Fair Poor	Pulley Present: Yes No	Pulley Type: Cast Steel Alum.	Pulley Material: Cast Iron Steel Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr. Brass/Babb.	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Mate Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Width: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Cast Treads: Good Fair Poor	Dep. Pulleys: Good Fair Poor	Dep. Lever Archor Good Fair Poor	Safety Latch Pivot: Good Fair Poor	Safety Latch Free: Good Fair Poor	Latch Tongue: Good Fair Poor	Latch Type: Curved Wedge	Grips: Quick Fair Poor Weak	Slot Width (in fraction of in.)	Additional Remarks
852	R	P	P	Y	PA	S	F	Bab	P	P	G	G	G	P																	3/4	
862	R	P	P	N						G	G	G	G	G																	3/4	
872	R	P	P	N						G	G	G	G	G																	3/4	
884	wood/wood	F/F	F/F	Y	2/6"	2/S	G/F	2/AF	G	P	P	P	P	P																	3/4	1 pulley not running - 2-6"
886	R	P	P	N						G	P	P	P	P																	13/16	
900	wood/wood	F/F	G/G	Y	CR	CI	G	Bab	G	F	P	P	P	P																	3/4	30-in.
902	R	P	P	N						G	P	P	P	P																	7/8	
910	R	P	P	N						G	P	P	G	P																	7/8	
912	R	P	P	Y	Urethane Alum.		G	AF	G	F	P	P	G	P																	7/8	
920	R	P	P	N						P	P	P	G	P																	5/8	
922	R	P	P	Y	Urethane Alum.		G	AF	G	P	P	P	G	P																	7/8	
930	R	P	P	N						G	P	P	G	P																	7/8	
932	R	P	P	N						G	P	P	G	P																	13/16	
940	R	P	P	N						G	P	P	G	P																	15/16	
942	R	P	P	Y	Urethane Alum.		G	AF	G	G	P	P	G	P																	13/16	
950	R	P	P	N						G	P	F	G	P																	3/4	
952	R	P	P	N						G	P	F	G	P																	5/8	
962	R	P	P	Y	PA	S	G	Bab	P	P	P	F	G	P																	13/16	
972	R	P	P	N						G	P	F	G	P																	3/4	
982	R	P	P	Y	2/6"	2/S	6/6	2/AF	G	P	P	P	P	P																	3/4	2-6"
1000	wood/wood	G/G	F/F	N						G	P	P	G	P																	11/16	

Street: Powell From: Pine To: California Inbound: _____ Outbound X

Date 8/ 15/78

Hatch No. PO	Hatch Cover: Vent, Fixed, CI, Wood	Hatch Cover: Cast	Hatch Frame: Cast	Pulley Present:	Pulley Type: Fixed, Tension	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-Fr., Brass/Babb.	Pulley Support: Cast	Channel Condition: Cast	Outside Rail: Cast	Inside Rail: Cast	Slot Rail: Cast	Pavement Condition: Good, Fair, Poor	Switch Points: Cast	Switch Rails: Cast	Switch Tongue: Cast	Gate Rails: Cast	Frog Rails: Cast	Slot Guides: Cast	Slot Points: Cast	Dep. Base Frame: Cast	Dep. Base Pulleys: Cast	Dep. Base Anchor Cast	Safety Latch Frame: Cast	Safety Latch Torque: Cast	Turnable Latch: Cast	Gypsy Rectangle Cast	Slot Width: Cast (in fraction of in.)	Additional Remarks
732	R	P	P	Y	Urethane Alum.	G	AF	G	G	P	P	G	F																3/4	
750	R	P	P	N					G	P	P	G	G																7/8	
758	R	P	P	Y	PA	S	F	Bab	P	G	G	P	G	P															1	
766	R	P	P	N						G	P	P	G	G															3/4	
770	W	G	G	N						G	P	P	G	G										G	F				1	Safety latch
774	W	G	G	N						G	P	P	G	G															3/4	
778	W	G	G	N						P	P	P	G	F										G	G				3/4	Safety latch
778	wood/ wood	G/G	G/G	Y	CR	CI	G	Bab	G	P	P	P	G	F															3/4	26-in.
780	R	P	P	N					G	P	P	G	P																7/8	
784	W	G	G	N					G	P	P	G	P																1 3/16	
788	W/W	G/G	G/G	Y	CR	CI	G	Bab	G	P	P	P	G	P															7/8	30-in.
790	4/W	4/G	4/G	N						P	P	P	P	P															5/8	Bumper bar
794	W	G	G	N	2/ 11" 2/5	G/G	2/ AF	G	P	P	P	P	P																5/8	11" Hold downs
798	W/W	G/G	G/G	Y	CR	CI	G	Bab	G	P	G	G	P	P															3/4	30-in.
800	R	P	P	N					G	G	G	G	F																13/16	
804	W	G	G	N					P	P	P	P	P																7/8	
806	W	G	G	Y	CR	CI	G	Bab	G	P	P	P	G	F															5/8	
812	R	P	P	Y	PA	S	G	Bab	G	P	P	P	P	G															7/8	
822	R	P	P	Y	PA	S	P	Bab	G	P	P	G	G	P															1 3/16	Pulley stripped
832	R	P	P	N					G	P	G	G	F																7/8	
842	wood/ wood	F/F	G/G	Y	CR	CI	G	Bab	G	P	P	G	G	F															11/16	

Street: Powell From: Bush To: Pine Inbound: _____ Outbound X

Date 8 / 15 / 78

Hatch No. / PO	Hatch Cover: Vert. Fixed, CI Vert.	Hatch Cover: Good, Fair, Poor	Hatch Frame: Good, Fair, Poor	Pulley Present: Yes, No	Pulley Type: Fair, Poor	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-Fric, Brass/Babb.	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Gutter Rail: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Gate Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Points: Good, Fair, Poor	Dep. Beam Trees: Good, Fair, Poor	Dep. Beam Pulleys: Good, Fair, Poor	Dep. Beam Anchor: Good, Fair, Poor	Safety Latch Trees: Good, Fair, Poor	Safety Latch Tongue: Good, Fair, Poor	Turnbuckle Latch: Good, Fair, Poor	Grippy Mechanism: Good, Fair, Poor	Exit Width: (in fraction of in.)	Additional Remarks
604	W	G	G	N						G	G	G	P	P														7/8	Sign return
610	R	P	P	N						G	G	G	P	P														3/4	
614	W	G	G	N						G	P	P	G	P														7/8	Sign return
622	R	P	P	N						G	P	P	G	F														3/4	
630	R	P	P	Y	PA	S	F	Bab	G	G	P	P	G	P														1 3/16	
640	R	P	P	Y	PA	S	P	Bab	G	F	P	P	G	G														1 3/16	Pulley stopped
644	W	G	G	N						G	P	P	G	P														5/8	Pre-empt
652	R	P	P	N						G	P	P	G	G														5/8	
660	R	P	P	Y	PA	S	G	Bab	P	P	F	G	G	P														1 1/16	
668	R	P	P	Y	Urethan: Alum.		G	AF	G	F	F	G	G	P														3/4	
676	wood/wood	F/F	F/F	Y	CR	CI	G	Bab	G	P	P	P	G	F														9/16	30-in.
678	wood/wood	F/F	F/F	Y	CR	CI	G	Bab	G	P	P	P	G	F														7/8	30-in.
684	W	G	G	N						G	P	P	G	F														5/8	
692	W	G	G	N						G	F	F	P	F														7/8	
698	W	G	G	N						G	P	P	P	P														1	
700	R/R	P/P	P/P	Y	DB	2/S	P/I	2/ AF		F	P	P		P								G	P	P					7/8	
702	R/W	P/G	P/G	Y	DB	2/S	P/I	2/ AF		P	P	P		P								G	P	P					1	
708	W	G	G	N						G	P	P	G	P														1	
710	W	P	P	N						G	P	P	G	P														1	
716	W	P	P	Y	PA	S	F	Bab	G	G	P	P	G	P														1 1/16	Bolt alongside of pulley
720	R	P	P	N						G	P	P	G	F														7/8	

Street: Powell From: Post To: Bush Inbound: _____ Outbound X

Date 8/14/78

Hatch No. PQ	Hatch Cover: Wood, Frame, CI, Mesh	Hatch Cover: Good, Fair, Poor	Hatch Type: Good, Fair, Poor	Pulley Present: Yes, No	Pulley Type: Face, Groove	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-fr., Brass/Babb.	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Outside Rail: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Gate Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Point: Good, Fair, Poor	Dep. Base Frame: Good, Fair, Poor	Dep. Base Pulleys: Good, Fair, Poor	Dep. Base Frame: Good, Fair, Poor	Safety Anchor: Good, Fair, Poor	Safety Latch Frame: Good, Fair, Poor	Safety Latch Torque: Good, Fair, Poor	Turnbuckle Latch: Good, Fair, Poor	Gypsy Mechanism: Good, Fair, Poor	Slot Width: Good, Fair, Poor (in fraction of in.)	Additional Remarks
442	R	P	P	Y	PA	S	P	Bab	P	P	P	F	G	P															1/2	Rope alongside pulley
452	R	P	P	Y	PA	S	G	Bab	F	P	P	F	G	P															5/8	
462	R	P	P	Y	PA	S	G	Bab	F	P	P	P	G	P															3/4	
472	R	P	P	N						G	P	P	G	P															1/4	
478	W	F	G	N						G	P	P		P															1 1/4	Take out
484	CI	G	G	Y	CR	CI	G	Bab	G	F	P	P	P	P															7/8	
488	R	P	P	N						P	P	P	P	F															3/4	
500	R/R	P/P	P/P	Y	DB	2/S	S/G	2/AF		F	P	P		P							G	G	P						1 1/8	
512	R	P	P	N						G	P	F	G	P															7/8	
522	W	P	P	N						G	F	F	G	F															3/4	
532	R	P	P	Y	Urethane Alum.		G	AF	G	G	F	F	G	P															3/4	
542	R	P	P	Y	PA	S	G	Bab	G	F	F	F	G	P															11/16	
546	W	G	G	N						G	F	F	G	P															11/16	
552	R	P	P	N						G	F	F	G	F															11/16	
562	R	P	P	Y	PA	S	G	Bab	F	P	F	F	G	G															5/8	Pulley squeaks
572	R	P	P	N						G	F	F	G	P															11/16	
582	Wood/Wood	F/F	F/F	Y	CR	CI	G	Bab	G	F	G	G	G	P															5/8	
584	Wood/Wood	F/F	F/F	Y	CR	CI	G	Bab	G	F	G	G	G	P															1/4	
596	W	P	P	N						P	G	G		P															15/16	Take out
600	R/R	P/P	P/P	Y	DB	2/S	S/G	2/AF		P	G	G		P							F	G	P						1	
602	R/R	P/P	P/P	Y	DB	2/S	S/G	2/AF		F	G	F		P							G	G	F						1/8	

Street: Powell From: O'Farrell To: Post Inbound: Outbound X

Date 8/14/78

Match No. PO	Hatch Cover: Wood, Iron, Cl. Iron	Hatch Cover: Good, Fair, Poor	Hatch Frame: Good, Fair, Poor	Pulley Present: Yes, No	Pulley Type: Flat, Groove	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-Fr., Brass/Babb.	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Outside Rail: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Male Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Point: Good, Fair, Poor	Dep. Beam Frame: Good, Fair, Poor	Dep. Beam Pulleys: Good, Fair, Poor	Dep. Beam Pulleys: Good, Fair, Poor	Safety Anchor: Good, Fair, Poor	Safety Latch Frame: Good, Fair, Poor	Safety Latch Tongue: Good, Fair, Poor	Turnable Latch: Good, Fair, Poor	Gypsy Mechanism: Good, Fair, Poor	Slot Width: (in fraction of in.)	Additional Remarks
200	R	P	P	N						G	P	P	P	P														3/4	
210	R	P	P	N						G	P	P	G	P														11/16	
220	R	P	P	Y	PA	S	F	Bab	P	P	P	P	G	P														3/4	
230	R	P	P	Y	PA	S	G	Bab	P	F	G	F	G	P														3/4	
240	R	P	P	N						G	G	F	G	P														3/4	
250	R	P	P	Y	PA	S	G	Bab	G	P	P	P	G	P														3/4	
260	R	P	P	Y	PA	S	F	Bab	P	P	P	P	F	P														7/8	
270	R	P	F	Y	PA	S	F	Bab	F	P	P	P	P	P														3/4	
280	wood/wood	F/F	P/F	Y	CR	CI	G	Bab	G	F	P	P	F	P														7/8	
290	R	P	P	N						G	P	P	G	P														3/4	
312	R	P	P	N						G	G	G	P	P														5/8	
322	R	P	P	N						G	G	F	G	P														5/8	
332	R	P	P	N						F	G	F	P	F														3/4	
342	R	P	P	Y	PA	S	F	Bab	F	P	G	F	G	P														7/8	
352	R	P	P	N						G	G	F	P	P														1	
362	R	P	P	Y	PA	S	G	Bab	F	G	G	F	G	P														13/16	
372	R	P	P	Y	PA	S	F	Bab	P	P	G	P	G	P														3/4	
382	wood/wood	F/F	F/F	Y	CR	CI	G	Bab	G	F	F	F	P	F														13/16	
386	CI	G	G	N						G	P	P	P	P														3/4	U.R.R.
422	R	P	P	N						G	P	F	P	P														3/4	
432	R	P	P	Y	PA	S	G	Bab	P	P	P	P	P	P														9/16	

Street: Powell From: Market To: O'Farrell Inbound: _____ Outbound X

Date 8/14/78

Hatch No. PO	Hatch Cover: Hatch Frame: Hatch Cover: Hatch Frame: Pulley Present: Pulley Type: Pulley Material: Pulley Condition: Pulley Bearings: Pulley Support: Channel Condition: Outside Rail: Inside Rail: Slot Rail: Pavement Condition: Switch Rails: Switch Tongue: Gate Rails: Frog Rails: Slot Guides: Slot Points: Dep. Beam Frame: Dep. Beam Pulleys: Dep. Beam Anchor: Safety Latch Frame: Safety Latch Type: Turnlatch: Gypsy Mechanism: Slot Width: (in fraction of in.)	Additional Remarks
4	CI G G Y CR CI G Bab G F P P F G	1"
12	CI G G Y 4" S G AF G F F F P G	3/4 Special at dip 4"
20	W G G N G G G P P	11/16
28	R P P N G G G G G	5/8
30	W G G N G G G F	3/4 Take out
32	W G G N G G G P F	11/16
38	R P P Y PA S F Bab P P G G G G	3/4
46	R P P N G G G G F	3/4
54	R P P Y Urethane Alum. G AF G F G G G F	3/4
64	CI G G Y PA S F Bab F F G G G G	3/4
76	CI G G Y PA S G Bab G P G G G P	3/4
78	CI G G N P G G G G	11/16
100	R P P N G G G P P	5/8
110	CI G G N G G P G P	5/8
120	R P P Y PA S G Bab P F G P G P	13/16
134	R P P N G G P G P	3/4
144	R P P Y PA S G Bab F F G P G P	7/8
156	R P P Y PA S G Bab F G P P G P	3/4
166	R P P Y PA S F Bab F P P P G F	3/4
176	[illegible] G/G G/G Y CR CI G Bras G P P P G F	3/4
196	R P P N G P P G F	1/4

Street: Mason From: Jackson To: Broadway Inbound: ____ Outbound X

Date 8/10/78

Match No. MA	Match Cover: Weld Frame, Cl. Fit	Match Cover: Cond.	Match Frame: Cond.	Pulley Frame: Pair Poor	Pulley Type: Yes No	Pulley Type: Code Fixed	Pulley Material: Cast Iron, Steel, Alum.	Pulley Cond.: Cond. Fair Poor	Pulley Bearings: Anti-Fr. Brass/Babb.	Pulley Supports: Cond. Fair Poor	Channel Condition: Cond. Fair Poor	Cutaway Fair Poor	Junction Fair Poor	Eliot Fair Poor	Pavement Condition: Cond. Fair Poor	Switch Points: Cond. Fair Poor	Switch Tongue: Cond. Fair Poor	Rail Fair Poor	Tee Rail: Cond. Fair Poor	Slot Cutaway: Cond. Fair Poor	Slot Points: Cond. Fair Poor	Dep. Lead Track: Cond. Fair Poor	Dep. Bed Pulleys: Cond. Fair Poor	Safety Catch: Cond. Fair Poor	Safety Catch Track: Cond. Fair Poor	Guide Switch: Cond. Fair Poor	Guy Wire: Cond. Fair Poor	Clock Fair Poor	Additional Remarks
1312	R	P	P	N						G	P	P	P	P													7/8	
1318	W	F	F	N						G	P	P		P													3/4 1 1/16	Take out
1320	R	P	F	Y	Urethan: Alum.	G	AF	P	P	G	G	G	P														3/4	
1330	R	P	P	N					G	G	G	G	P														13/16	
1338	R	P	F	Y	Urethan: Alum.	G	AF	G	P	G	G	G	P														11/16	
1340	W	G	F	N				G	F	F	G	P															1	
1354	R	F	F	Y	PA	S	G	Bab	G	G	G	G	G	P													3/4	
1362	R	P	F	N					G	F	F	G	P														3/4	
1370	R	F	F	Y	Urethan: Alum.	G	AF	G	G	F	F	G	P														3/4	Rope on side
1386	R	F	F	N					G	G	G	P	G														11/16	
1400	Wood/ Wood	F/F	F/F	Y	CR	CI	G	Bab	G	P	G	G	G	P													7/8	
1410	R	F	F	N						G	F	F	G	F													3/4	
1422	R	F	F	N						G	F	F	G	P													5/8	
1430	R	P	P	N						G	F	F	G	P													3/4	
1440	R	P	F	Y	PA	S	G	Bab	F	G	F	F	G	P													3/4	
1444	W	G	G	N						G	F	F	G	F													7/8	
1450	W/W	G/G	G/G	Y	DB	2/S	P/P	27 AF		G	F	F		F						G	P	G						Rope high and along side of pulley.
1462	W	G	G	N						G	F	F	G	G													3/4	
1490	W	G	G	N						G	F	F		P													1 6	Take out
1500	W	G	G	Y	PA	S	G	Bab	P	G	F	F	G	G													3/4	
1502	W	G	G	N						G	F	F	G	F													1	Sewer

Street: Mason From: Broadway To: Green Inbound: ____ Outbound X

Date 8/ 10/ 78

Hatch No. MAS	Hatch Cover: W=Wood, C=Concrete, Fiber	Hatch Cover: G/G=Good/Good, F/F=Fair/Fair, P/P=Poor/Poor	Hatch Frame: G/G=Good/Good, F/F=Fair/Fair, P/P=Poor/Poor	Pulley Present: Y=Yes, N=No	Pulley Type: F=Fixed, S=Swivel	Pulley Material: CI=Iron, S=Steel, Alum.	Pulley Condition: G=Good, F=Fair, P=Poor	Pulley Bearings: Bab=Babbitt, Brs=Bronze, AF=Anti-Friction	Pulley Support: G=Good, F=Fair, P=Poor	Channel Condition: G=Good, F=Fair, P=Poor	Gutter Condition: G=Good, F=Fair, P=Poor	Inlets Fail: G=Good, F=Fair, P=Poor	Slot Fail: G=Good, F=Fair, P=Poor	Pavement Condition: G=Good, F=Fair, P=Poor	Switch Fails: G=Good, F=Fair, P=Poor	Switch Torque: G=Good, F=Fair, P=Poor	Vale Fails: G=Good, F=Fair, P=Poor	Frog Fails: G=Good, F=Fair, P=Poor	Slot Guides: G=Good, F=Fair, P=Poor	Slot Points: G=Good, F=Fair, P=Poor	Dep. Lead Frame: G=Good, F=Fair, P=Poor	Dep. Lead Pulleys: G=Good, F=Fair, P=Poor	Dep. Lead Anchor: G=Good, F=Fair, P=Poor	Safety Latch Frame: G=Good, F=Fair, P=Poor	Safety Latch Torque: G=Good, F=Fair, P=Poor	Turnbuckle Latch: G=Good, F=Fair, P=Poor	Grate Fasteners: G=Good, F=Fair, P=Poor	Slot Width: (in fraction of in.)	Additional Remarks
1510	W	G	G	Y	FR	S	F	Bab	G	G	G	G	G	F	✓														7/8	
1518	W	G	G	N						G	G	G	G	G															7/8	
1532	W/W	G/G	G/G	Y	DB	2/S	G/G	2/AF		G	G	G		P							G	G	G						1	
1542	W	G	G	N						G	G	G	P	P															7/8	
1550	R	P	P	N						G	G	G	G	G															3/4	
1562	R	P	P	Y	R	CI	F	Brs	G	G	G	G	G	G															3/4	
1570	R	P	F	N						G	G	G	G	G															13/16	
1578	WOOD/WOOD	G/G	G/G	Y	CR	CI	G	Bab	G	G	G	G	G	G															3/4	30-in.
1588	R	P	F	Y	RA	S	G	Bab	G	F	G	G	G	F															13/16	Rope high
1600	R	P	F	Y	PA	S	G	Bab	G	F	G	G	G	G															7/8	
1610	R	P	F	N						G	G	G	G	G															5/8	
1618	R	P	F	Y	PA	S	G	Bab	G	P	G	G	G	G															3/4	
1678	R	P	F	Y	Urethane Alum.		G	AF	G	F	G	G	G	G															3/4	
1640	R	P	F	Y	RA	S	G	Bab	F	G	G	G	G	F															3/4	
1650	R	P	F	Y	PA	S	F	Bab	G	F	G	G	G	G															5/8	
1660	R	P	F	Y	PA	S	G	Bab	G	F	G	G	G	G															13/16	
1670	R	P	F	Y	PA	S	G	Bab	G	F	G	G	G	P															3/4	
1676	W	P	P	N						G	G	G	G	P															7/8	Take out
1680	W	G	G	Y	PA	S	P	Bab	G	P	G	G	G	G															7/8	Pulley stopped
1700	WOOD/WOOD	F/F	F/F	Y	CR	CI	G	Bab	G	G	G	G	G	G															3/4	26-in.
1702	WOOD/WOOD	F/F	F/F	Y	CR	CI	G	Bab	G	G	G	G	G	G															5/8	30-in.

Street: Mason From: Filbert To: Columbus/Lombard Inbound: Outbound X

Date 8/10/78

Match No. MA	Match Cover: Good Fair Poor	Match Cover: Good Fair Poor	Match Frame: Good Fair Poor	Pulley Present: Yes No	Pulley Type: Cast Forged	Pulley Material: Cast Iron Steel Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr. Ball Grease/Ball	Pulley Support: Good Fair Poor	Chamber: Good Fair Poor	Concrete: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement: Good Fair Poor	Switch Rails: Good Fair Poor	Switch Rodger: Good Fair Poor	Gate Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Width: Good Fair Poor	Slot Points: Good Fair Poor	Dep. Beam: Good Fair Poor	Dep. Beam Pulleys: Good Fair Poor	Dep. Beam Anchor: Good Fair Poor	Safety Latch Frame: Good Fair Poor	Safety Latch Cover: Good Fair Poor	Safety Latch Tumbler: Good Fair Poor	Grips: Good Fair Poor	Grips: Worn/Missing	Slot Width: (in fraction of ins.)	Additional Remarks
1922	R	P	P	Y	PA	S	P	Bab	G	P	P	P	G	G							G	G	P						5/8	Pulley stopped/cut
1928	R	P	P	N						G	P	P	G	F															3/4	
1938	R	P	P	Y	PA	S	G	Bab	G	P	P	P	G	G															3/4	
1948	R	P	P	Y	PA	S	P	Bab	P	P	P	P	G	F															11/16	Pulley stopped/cut
1958	R	P	P	N						G	P	P	G	P															7/8	
1968	R	P	P	N						G	P	P	G	P															11/16	
1978	R/R	P/P	P/P	Y	DB	2/S	G/G	2/AF		F	P	P		G							G	G	P						5/8	
1988	R	P	P	N						G	P	P	G	P															3/4	
1996	R	P	P	N						G	P	P	G	G															5/8	
1998	WOOD/ WOOD	F/F	G/G	Y	CR	CI	G	Bab	G	F	G	G	G	G															7/8	30°
CO/	COLUMBUS AVENUE																														
800	R	P	P	N						G	P	P	G	F															1	
816	R	P	P	N						G	P	P	G	P															5/8	
826	R	P	P	Y	PA	S	G	Bab	G	P	P	P	G	P															3/4	Rope high
836	R	P	F	N						G	P	P	G	P															3/4	
846	R	P	P	Y	PA	S	G	Bab	G	P	P	P	G	P															3/4	Rope high
856	R	P	P	N						G	P	P	G	P															3/4	
886	R	P	F	N						G	G	F	G	F															3/4	
896	Weld	G	G	N						G	G	F	P	P															7/8	
900	Weld	P	F	N						F	G	F	G	P															5/8	
902	R	P	F	N						F	G	F	G	P															9/16	

Street: Mason From: Green To: Filbert Inbound: _____ Outbound X

Date 8 / 10 / 78

Hatch No. MA	Hatch Cover: Wood, Precast, CI Hook	Hatch Cover: Good, Fair, Poor	Hatch Frame: Good, Fair, Poor	Pulley Present: Yes, No	Pulley Type: Face, Recess	Pulley Material: Cast Iron, Steel, Alloy	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-Fr, Babbitt	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Gutter Condition: Good, Fair, Poor	Inlets Fall: Good, Fair, Poor	Slot Fall: Good, Fair, Poor	Pavement Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Gate Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Points: Good, Fair, Poor	Dep. Brac Frame: Good, Fair, Poor	Dep. Brac Pulleys: Good, Fair, Poor	Dep. Brac Anchor: Good, Fair, Poor	Safety Latch: Good, Fair, Poor	Safety Latch Frame: Good, Fair, Poor	Safety Latch Stroke: Good, Fair, Poor	Safety Latch Mechanism: Good, Fair, Poor	Gravity Mechanism: Good, Fair, Poor	Slot Width: (in fraction of in.)	Additional Remarks
1712	R	P	P	N						G	P	P	G	G															7/8	
1720	R	P	P	Y	PA	S	F	Bab	G	G	P	P	G	G															3/4	
1728	R	P	P	Y	PA	S	G	Bab	G	G	P	P	G	F															7/8	
1740	R	P	P	Y	PA	S	G	Bab	G	G	P	P	G	P															7/8	Rope light
1746	R	P	P	N						G	P	P	G	F															7/8	
1760	R	O	O	N						F	P	P	G	P															15/16	
1770	R	P	P	N						F	P	P	G	F															7/8	
1780	R/R	P/P	P/P	Y	DB	2/S	G/G	2/ AF		F	P	P		P						G	G	G							7/8	
1800	R	P	P	N						G	F	F	G	P															1/2	
1802	WOOD / WOOD	F/F	G/G	Y	CR	CI	G	Bab	G	F	F	F	G	P															5/8	20"
1810	R	P	P	N						G	P	F	G	G															7/8	
1818	R	P	P	N						G	P	F	G	G															3/4	
1828	R	P	P	Y	PA	S	F	Bab	F	F	P	F	G	G															13/16	
1838	R	P	P	N						G	P	F	G	G															3/4	
1848	R	P	P	Y	PA	S	G	Bab	F	G	P	F	G	G															3/4	Rope high
1858	R	P	P	N						G	P	F	G	F															3/4	
1868	R	P	P	N						G	P	F	G	G															3/4	
1878	R/R	P/P	P/P	Y	DB	2/S	G/G	2/ AF		F	P	F		P						G	G	P							5/8	
1888	R	P	P	N						G	P	F	G	F															3/4	
1900	WOOD / WOOD	F/F	G/G	Y	CR	CI	G	Bab	G	F	P	P	G	G															3/4	26"
1912	R	P	P	N						G	P	P	G	P															3/4	

Street: Columbus From: Lombard To: Taylor/Francisco Inbound: ___ Outbound X

Date 8 / 10/ 78

Hatch No.	Hatch Cover: Single Piece, Cl. Grade	Hatch Cover: Cl. Grade	Hatch Frame: Fair Poor	Pulley Frame: Fair Poor	Pulley Present: Yes No	Pulley Type: Sheave, Axle	Pulley Material: Iron, Steel, Alum.	Pulley Condition: Cl. Grade	Pulley Bearings: Fair Poor	Pulley Bearings: Anti-Friction, Babbitt	Pulley Support: Cl. Grade	Pulley Support: Fair Poor	Cradle Condition: Cl. Grade	Cradle Fair Poor	Inside Rail: Cl. Grade	Inside Rail: Fair Poor	Slot Rail: Cl. Grade	Slot Rail: Fair Poor	Pavement Condition: Cl. Grade	Pavement Condition: Good Fair Poor	Switch Rails: Cl. Grade	Switch Rails: Fair Poor	Switch Tongue: Cl. Grade	Switch Tongue: Fair Poor	Vale Rails: Cl. Grade	Vale Rails: Fair Poor	Frog Rails: Cl. Grade	Frog Rails: Fair Poor	Slot Guides: Cl. Grade	Slot Guides: Fair Poor	Slot Points: Cl. Grade	Slot Points: Fair Poor	Dep. Trac Pulleys: Cl. Grade	Dep. Trac Pulleys: Fair Poor	Dep. Trac Pulleys: Cl. Grade	Dep. Trac Pulleys: Fair Poor	Safety Anchor Cl. Grade	Safety Anchor Fair Poor	Safety Latch Frame: Cl. Grade	Safety Latch Frame: Fair Poor	Safety Latch Spring: Cl. Grade	Safety Latch Spring: Fair Poor	Guard Protector: Cl. Grade	Guard Protector: Fair Poor	Slot Width (At Narrow Point of Slot)	Additional Remarks
CO																																													
910	R	P	P	Y	PA	S	P	Bab	G	P	G	P	G	P																														7/8	Pulley stopped
918	R	F	P	Y	PA	S	P	Bab	P	P	G	F	G	P																														3/4	Pulley drags
926	R	P	P	N						F	G	F	G	P																														13/16	
934	R	P	F	Y	PA	S	G	Bab	G	F	G	F	P	P																														11/16	
944	R	P	F	Y	Urethane Alum.		G	AF	G	F	G	F	P	P																														3/4	
956	R	F	F	Y	Urethane Alum.		G	AF	P	F	G	F	P	P																														11/16	
966	R	F	F	Y	Urethane Alum.		F	AF	P	F	G	F	G	P																														3/4	
976	R	F	F	N						G	G	F	P	F																														3/4	
986	R	P	P	Y	PA	S	P	Bab	P	F	G	F	P	F																														5/8	Rope on side
994	R	F	F	N						G	G	F	P	F																														3/4	
996	R	F	F	N						G	G	F	G	F																														1	
TA	TAYLOR STREET																																											
2300	W	F	G	Y	CR	CI	G	Bab	G	F	G	G	G	P																														1	
2310	R	P	F	Y	PA	S	P	AF	P	P	G	G	G	P																														3/4	Pulley stopped - rope cut
2320	R	F	P	Y	PA	S	G	Bab	P	F	G	G	P	P																														13/16	
2330	R	P	F	Y	Urethane Alum.		G	AF	P	G	G	G	G	P																														13/16	
2340	R	P	P	N						G	G	G	G	P																														11/16	
2350	R	P	P	Y	PA	S	G	Bab	G	G	G	G	G	P																														5/8	
2360	R	P	F	N						G	G	G	G	P																														11/16	
2370	R	P	P	N						G	P	G	G	P																														7/8	
2380	R	P	P	N						G	G	G	G	P																														11/16	

FRANCISCO

20

Street: Taylor From: Francisco To: Bay Inbound: Outbound X

Date 8 / 10 / 78

Hatch No. TA	Hatch Cover: Well, Plank, CI, Wood	Hatch Cover: Good, Fair, Poor	Hatch Frame: Good, Fair, Poor	Pulley: Yes, No	Pulley Present: Yes, No	Pulley Type: Cone, Lattera	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Outside Rail: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement Condition Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Mate Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Point: Good, Fair, Poor	Dep. Beam Frame: Good, Fair, Poor	Dep. Beam Pulleys: Good, Fair, Poor	Dep. Beam Anchor Good, Fair, Poor	Safety Latch Frame: Good, Fair, Poor	Safety Latch Tongue: Good, Fair, Poor	Turnable Latch: Good, Fair, Poor	Gypsy Mechanism Good, Fair, Poor	Slot Width: (in fraction of in.)	Additional Remarks
2402	R	P	F	Y	PA	S	G	Bab	P	F	G	G	G	P																13/16	
2412	R	F	F	N						G	G	G	G	P																13/16	
2422	R	P	F	Y	PA	S	G	Bab	P	G	G	G	G	P																7/8	
2432	R	P	F	Y	PA	S	F	Bab	G	G	G	G	G	P																7/8	
2442	R	F	F	Y	PA	S	G	Bab	G	G	G	G	G	P																3/4	
2452	R	F	F	Y	PA	S	F	Bab	P	G	G	G	G	P																3/4	
2462	W	F	G	N						G	G	G	G	P																7/8	Take out
2464	R/R	F/F	F/F	N						F	G	G	G	P																3/4	Bumper bar
2468	R	G	G	Y	R	CI	G	Bab	G	G				G																	Blind channel
2474	R	G	G	Y	CR	CI	G	Bras	G	G				G																	26"
2480	R	G	G	Y	HD	CI	G	Bab	G	G				G																	26"

Street: Taylor From: Bay To: Columbus Inbound: X Outbound: ____

Date 8/10/78

Hatch No.	Hatch Cover: Good Fair Poor	Hatch Cover: Wood Fiber CI Wood	Hatch Frame: Good Fair Poor	Pulley Fair Poor	Pulley Present: Yes No	Pulley Type: Cast Iron Steel Alum.	Pulley Material: Cast Iron Steel Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr. Babbitt	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Rails: Good Fair Poor	Switch Points: Good Fair Poor	Switch Throws: Good Fair Poor	Gate Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Points: Good Fair Poor	Dep. Head Frame: Good Fair Poor	Dep. Head Pulleys: Good Fair Poor	Dep. Head Kicker Good Fair Poor	Safety Latch Free: Good Fair Poor	Safety Latch Free: Good Fair Poor	Turnover Latch Free: Good Fair Poor	Gipsy Pocket: Good Fair Poor	Slot Width (in fraction of in.)	Additional Remarks
TA																															
2467	R	G	G	Y	CR	CI	G	Bab	G	F	G	G	G	F																3/4	20°
2465	R	F	F	Y	GYP	CI	P	Brz	G	G	G	G	G	P															R	3/4	
2461	R	P	F	N						G	G	G	G	P																1"	
2451	CI	G	G	N						G	G	G	P	P																3/4	U.R.R. cover
2441	R	P	P	F	N					G	G	G	P	P																7/8	
2431	R	P	P	Y	PA	S	F	Bab	F	G	G	G	P	P																11/16	
2421	R	P	F	Y	PA	S	G	Bab	F	G	G	G	G	P																7/8	
2411	R	P	F	Y	PA	S	P	Bab	G	G	G	G	G	P																1/4	
2401	R	P	F	Y	PA	S	G	Bab	G	G	G	G	P	P																3/4	Rope high
2379	R	F	F	Y	PA	S	G	Bab	G	G	G	G	G	P																7/8	Rope high
2369	R	P	F	N						G	G	G	P	P																1/2	
2359	R	P	P	N						G	G	G	G	P																3/4	
2349	R	P	F	Y	PA	S	G	Bab	F	G	G	G	P	P																7/8	Rope high Pulley stopped - rope cutting
2339	R	F	P	Y	PA	S	P	Bab	P	F	G	G	P	P																3/4	
2329	R	F	F	N						G	G	G	P	P																3/4	
2319	R	P	P	Y	PA	S	G	Bab	P	P	G	G	G	P																13/16	Rope high Pulley down - rope cutting
2309	R	P	P	Y	PA	S	P	Bab	P	P	G	G	G	P																5/8	Bearings dry 20°
2301	Wood	Wood	F/G	P/F	Y	CR	CI	G	Brz	G	P	G	G	G	P																	
CO																														1/8	
995	R	P	P	N						F	G	G	G	F																1/4	
985	R	P	F	Y	Urethane Alum.		G	AF	P	P	G	F	G	P																	

COLUMBUS AVENUE

Street: Columbus From: Taylor To: Mason Inbound: X Outbound

Date 8/11/78

Match No.	Match Cover: Wood, Fiber, CI, Steel	Match Cover: Fair, Poor	Match Frame: Fair, Poor	Pulley Present: Yes, No	Pulley Type: Pole, Tangent	Pulley Material: Cast Iron, Steel, Alloy	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Live, Frozen	Pulley Support: Brkt, Direct	Channel Condition: Good, Fair, Poor	Outside Rail: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Rate Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Point: Good, Fair, Poor	Dep. Bars Frame: Good, Fair, Poor	Dep. Bars Pulleys: Good, Fair, Poor	Dep. Bars Anchor: Good, Fair, Poor	Safety Latch: Good, Fair, Poor	Safety Latch Frame: Good, Fair, Poor	Turnbuckle Latch: Good, Fair, Poor	Cable: Good, Fair, Poor	Cable Attachment: Good, Fair, Poor	Slot Width (in. fraction of in.)	Additional Remarks
CO																														
975	R	P	P	Y	PA	S	P	Bab	P	F	G	F	G	F															3/4	Pulley down - Rope cutting
965	R	P	F	N						G	G	F	P	P															3/4	
955	R	F	F	Y	PA	S	P	Bab	P	G	G	F	P	F															13/16	Pulley stopped - rope cut
943	R	P	F	Y	PA	S	F	Bab	P	F	F	F	G	P															3/4	
933	R	P	P	N						G	G	F	G	P															3/4	
925	R	P	F	Y	PA	S	P	Bab	P	P	F	F	G	P															11/16	
917	W	G	G	N						G	F	F	G	P															3/4	
909	R	P	F	N						G	F	F	G	P															11/16	
901	R	P	P	N						G	F	F	P	P															1/2	
895	R	P	P	N						G	F	F	G	P															3/4	
885	R	P	F	N						F	F	F	P	P															3/4	Rope hitting slot
855	R	P	P	N						F	G	F	P	F															3/4	Rope hitting slot
845	R	P	P	N						G	G	F	G	F															3/4	
835	R	P	F	Y	PA	S	G	Bab	F	P	G	F	G	F															1/2	Rope high
825	R	F	F	Y	PA	S	G	Bab	F	P	G	F	G	F															1/2	Rope high
815	R	P	P	Y	PA	S	G	Bab	G	G	G	G	P	P															1/2	Rope high - (not touching)
811	R	P	F	N						G	G	G	P	P															1	

Street: Mason From: Columbus To: Union Inbound: X Outbound

Date 8/11/78

Match No. MA	Match Cover: Wood / Wood	Match Cover: Fiber Glass / Ci Filled	Match Cover: Cast Iron / Cast Iron	Match Frame: Good Fair Poor	Pulley Type: Good Fair Poor	Pulley Present: Yes No	Pulley Type: Cone / Sheave	Pulley Material: Cast Iron Steel Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr. Fric. / Babb.	Pulley Supports: Good Fair Poor	Channel Condition: Good Fair Poor	Gutter Condition: Good Fair Poor	Track Fall: Good Fair Poor	Slot Fall: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Points: Good Fair Poor	Switch Tongue: Good Fair Poor	Gate Paths: Good Fair Poor	Free Paths: Good Fair Poor	Slot Gutter: Good Fair Poor	Slot Points: Good Fair Poor	Dep. Gate Trees: Good Fair Poor	Dep. Gate Pulleys: Good Fair Poor	Dep. Free Anchor: Good Fair Poor	Safety Latch Free: Good Fair Poor	Safety Latch Tongue: Good Fair Poor	Pulley Latch: Good Fair Poor	Overall Width: Good Fair Poor	Additional Remarks
1999	Wood / Wood	P/P	F/F	Y	CR	CI	G	Bab	G	F	F	F	P	F															7/8	30"
1987	R	F	F	N						G	F	G	P	P															1/2	
1977	R/R	P/P	P/P	Y	DB	2/S	G/G	2/ AF		P	G	G		G								G	G	G					7/8	
1967	R	P	P	N						G	G	G	G	G															13/16	
1957	R	P	P	N						G	G	G	G	F															3/4	
1947	R	P	P	N						G	G	G	G	G															3/4	
1937	R	P	P	Y	PA	S	G	Bab	F	P	G	G	G	G															5/8	
1927	R	P	P	N						G	G	G	G	F															3/4	
1921	R	P	P	Y	PA	S	G	Bab	F	G	G	G	G	G															17/16	
1911	R	P	P	Y	PA	S	G	Bab	G	G	G	G	G	G															17/16	
1901	Wood / Wood	G/G	G/G	Y	CR	CI	G	Bab	G	P	G	G	G	G															17/16	20"
1887	R	F	F	N						G	G	G	P	P															11/16	
1877	R/R	P/P	F/F	Y	DB	2/S	P/P	2/ AF		P	G	G		F								G	P	G					7/8	1 Pulley Flat
1867	R	P	P	N						G	G	G	G	G															5/8	
1857	R	P	P	N						G	G	G	P	P															3/4	
1847	R	P	P	Y	PA	S	F	Bab	G	P	G	G	F	P															17/16	Rope high
1837	R	P	P	N						G	G	G	G	P															3/4	
1827	R	P	P	Y	PA	S	F	Bab	P	F	G	G	G	F															3/4	
1817	R	P	P	N						G	G	G	G	G															3/4	
1809	R	P	P	Y	Urethane Alum.		G	AF	G	P	G	G	G	G															5/8	
1803	Wood / Wood	F/F	F/F	Y	CR	CI	G	Bab	G	P	G	G	P	G															13/16	20"

Street: Mason From: Union To: Vallejo Inbound: X Outbound

Date 11/11/78

Match No. MA	Match Cover: Yard Level, Cl. Fair Poor	Patch Cover: Good Fair Poor	Patch Trace: Good Fair Poor	Pulley Present: Yes No	Pulley Type: Face Covers	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr., Brass, Bab.	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Rail Joints: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Points: Good Fair Poor	Dep. Base Trace: Good Fair Poor	Dep. Base Pulleys: Good Fair Poor	Dep. Base Anchor: Good Fair Poor	Safety Latch: Good Fair Poor	Safety Latch Trace: Good Fair Poor	Turnaround Latch: Good Fair Poor	Grips: Good Fair Poor	Slot Width: (in fraction of in.)	Additional Remarks
1801	R	P	P	N						G	F	F	P	P														1/8	
1781	R/K	P/I	P/P	Y	DH	2/S	G/G	27 AF		P	F	F		P						G	G	G						3/4	Roller in pit
1781	R	P	P	N						P	F	F	F	P														3/4	
1769	W	G	P	N						G	F	F	F	P														3/4	
1759	R	P	P	N						G	F	F	F	P														7/8	
1745	W	G	P	N						G	G	G	F	P														7/8	
1739	R	P	P	Y	PA	S	F	Bab	P	G	G	G	G	P														3/4	Bearings, dry, squeaking
1727	R	P	P	N						G	G	G	G	P														3/4	
1719	R	P	P	Y	Urethane Alum.		G	AF	G	G	G	G	G	F														7/8	
1711	R	P	P	Y	Urethane Alum.		G	AF	G	F	G	G	G	F														7/8	
1705	W	G	G	N						G	G	G	G	G									G	G				1 1/16	
1703	Wood	F/I	F/F	Y	CR	CI	G	Bab	G	G	G	G	G	F														7/8	30" Dry squeaking
1701	Wood	F/I	F/F	Y	CR	CI	G	Bab	G	G	G	G	G	F														117/16	30"
1699	R	P	P	N						G	G	G	G	F														3/4	
1679	W	P	P	Y	PA	S	P	Bab	P	P	G	G	G	F														7/8	Pulley down - rope cutting
1669	R	P	P	N						G	G	G	G	G														7/8	
1659	R	P	P	Y	PA	S	F	Bab	P	F	G	G	G	G														7/8	
1649	R	P	P	N						F	G	G	G	G														3/4	
1639	R	P	P	Y	PA	S	G	Bab	P	F	G	G	G	F														7/8	
1627	R	P	P	N						G	G	G	G	G														7/8	
1617	R	P	P	N						G	G	G	G	F														7/8	

Street: Mason From: Vallejo To: Pacific Inbound: X Outbound

Date 8/11/78

Hatch No. MA	Hatch Cover: Weld. Plate / Cast Iron Cover	Hatch Cover: Wood / Cast Iron Cover	Hatch Frame: Good Fair Poor	Pulley Present: Yes No	Pulley Type: Pole Trough	Pulley Material: Cast Iron Steel Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Int. Fr. Brass/ Babb.	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Curbside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Gate Points: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Points: Good Fair Poor	Insp. Hand Trucks: Good Fair Poor	Insp. Pass Cards: Good Fair Poor	Insp. Trolleys: Good Fair Poor	Insp. Trucks: Good Fair Poor	Battery Switch Frame: Good Fair Poor	Battery Switch Cover: Good Fair Poor	Turnbuckles: Good Fair Poor	Signal Post: Good Fair Poor	Signal Post Foundation: Good Fair Poor	Signal Post Base: Good Fair Poor (in direction of Insp.)	Additional Remarks
1609	R	P	P	Y	PA	S	G	Bab	G	G	G	G	G	F																	13/16	
1601	R	F	F	N						P	G	G	G	P																	7/8	
1587	R	P	P	Y	PA	S	P	Bab	P	F	G	G	G	P																	13/16	Pulley stopped - Rope cutting
1579	WOOD / WOOD	G/G	G/G	Y	CR	CI	G	Bras	G	P	G	G	G	G																	5/8	20"
1569	R	P	P	N						G	G	G	G	G																	3/4	
1561	R	P	P	Y	PA	S	F	Bab	P	F	G	G	G	G																	3/4	
1549	R	P	P	N						G	G	G	G	F																	5/8	
1541	W	G	G	N						G	G	G	P	F																	7/8	
1533	W/W	G/G	G/G	Y	DB	2/S	P/P	2/AF		F	G	G		F							G	P	G								7/8	1 Pulley stopped
1519	W	G	G	Y	PA	S	G	Bab	G	P	G	G	G	G																	1 1/8	Rope high
1511	R	P	G	N						G	G	G	G	G																	7/8	
1503	W	G	G	N						F	G	G	G	F																	13/16	Sewer drain
1501	W	G	G	Y	PA	S	G	Bab	G	P	G	G	P	G																	3/4	
	W	G	G	N						G	G	G	G	F																	13/16	Pre-empt
1463	W	G	G	N						G	G	G	F	P																	1	Old pre-empt - Rope high
1461	W	G	G	N						G	G	G	F	P																	1 1/8	Rope hitting slot rail
1451	W/W	G/G	G/G	Y	DB	2/S	G/G	2/AF		F	G	G		F							G	G	G								7/8	
1445	W	G	G	N						G	G	G	G	G																	13/16	
1439	R	P	P	N						G	G	G	G	P																	3/4	
1435	W	G	G	N						G	G	G	G	F																	1	Old mechanical pre-empt
1429	R	P	P	Y	PA	S	F	Bab	F	P	G	G	G	G																	7/8	

Street: Mason From: Pacific To: Jackson Inbound: X Outbound

Date 8/11/78

Hatch No.	Hatch Cover: Material	Hatch Cover: CI Hook	Hatch Frame:	Pulley Present:	Pulley Type:	Pulley Material:	Pulley Lettering	Pulley Condition:	Pulley Bearings:	Anti-Fr. Brass/ Babb.	Pulley Support:	Channel Condition:	Outside Rail:	Inside Rail:	Slot Rail:	Pavement Condition	Switch Rails:	Switch Tongue:	Mate Rails:	Frog Rails:	Slot Guides:	Slot Point:	Dep. Beam Frame:	Dep. Beam Pulley(s):	Dep. Beam Anchor	Safety Latch Frame:	Safety Latch Tongue:	Turntable Latch:	Gypsy Mechanism	Slot Width: (in fraction of in.)	Additional Remarks
1421	R	P	P	N							G	G	G	G	P														3/4	
1419	R	P	P	Y	PA	S	G	AF	F	G	G	G	G	P															3/4	
[illegible]	Wood	G/G	P/P	Y	CR	CI	G	Bab	G	F	G	G	P	G															11/16	26"
1395	Weld	P	P	N						G	G	G	G	F															11/16	
1377	Weld	G	G	N						F	G	F	G	P															3/4	Signal return
1369	Riv	P	P	N						F	G	G	G	F															3/4	
1361	R	P	P	N						G	G	G	G	P															11/16	
1353	W	P	P	Y	PA	S	F	Bab	G	P	G	G	G	P															3/4	
1341	R	P	P	N						G	G	G	G	F															3/4	
1329	R	F	F	Y	PA	S	F	Bab	F	P	G	G	G	F															5/8	
1319	R	P	P	Y	PA	S	F	Bab	P	P	F	F	G	P															3/4	Rope high
1311	R	P	P	N						G	G	G	G	F															11/16	
1303	Wood	F/F	G/G	Y	CR	CI	G	Bab	G	F	G	G	G	P															1/2	Bearings 30" dry
[illegible]	R	P	P	N						F	G	G	G	P															5/8	
1293	R	P	P	N						G	G	G	P	P															1/2	
1287	R	P	P	Y	PA	S	F	Bab	P	P	G	G	P	P															5/8	
[illegible]	R	P	P	N						G	G	G	G	P															7/8	
1267	CI	G	G	N						F	G	G	G	P															7/8	U.R.R
1263	R	P	F	N						G	G	G	G	P															13/16	
1257	R	F	P	Y	PA	S	F	Bab	P	P	G	G	P	P															7/8	Pulley stopped - Rope alongside of it
1244	R	P	P	N						F	G	G	P	P															5/8	Rope dragging on channel

Street: Mason From: Jackson To: Washington Inbound: X Outbound

Date 8 / 11 / 78

Hatch No. MA	Hatch Cover: Wood, Frame, Cl. Rub.	Hatch Cover: Good, Fair, Poor	Hatch Frame: Good, Fair, Poor	Pulley Present: Yes, No	Pulley Type: Single, Double	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Guideface Condition: Good, Fair, Poor	Trace Rail: Good, Fair, Poor	Dist Rail: Good, Fair, Poor	Pavement Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Gate Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Points: Good, Fair, Poor	Dep. Trace: Good, Fair, Poor	Dep. Trace Pulleys: Good, Fair, Poor	Dep. Bear Pulleys: Good, Fair, Poor	Safety Arches: Good, Fair, Poor	Safety Latch: Free, Fair, Poor	Safety Latch Surface: Good, Fair, Poor	Switch Latch: Good, Fair, Poor	Gibby Pressure: Good, Fair, Poor	Gibby Stem: Good, Fair, Poor	Gibby Stem (in fraction of in.)	Additional Remarks
1237	R	P	P	N						P	P	P	P	P															5/8	
1252	W	P	P	N						G	G	G		P															5/8	Take out
1232	R	F	F	N						G	P	F	G	P															1/2	
1228	R	P	P	N						G	P	P	P	P	P	P	P	P	P	P										Old turn
1222	W	G	G	N						G	G	G	F	P															3/4	Pre-empt
1216	R	P	P	N						G	G	G	P	F															11/16	
1206	R	F	F	N						G	F	F	P	F															5/8	
1202	Wood/ Wood	F/F	P/P	N						G	G	G	P	P															7/8	Bumper bar bell
1200	Wood/ Wood	P/P	P/P	Y	CR	CI	P	Bab	G	F	G	G	P	P															1	

Street: JACKSON From: MASON To: TAYLOR Inbound: _____ Outbound X

Date 8/4/78

Hatch No.	Hatch Cover: Material	Hatch Cover: Condition	Hatch Frame: Condition	Pulley Present:	Pulley Type: Code Letters	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Mate Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Beam Frame: Good Fair Poor	Dep. Beam Pulleys: Good Fair Poor	Dep. Beam Anchor Good Fair Poor	Safety Latch Frame: Good Fair Poor	Safety Latch Tongue: Good Fair Poor	Turnable Latch: Good Fair Poor	Gypsy Mechanism Good Fair Poor	Slot Width: Good Fair Poor (in fraction of in.)	Additional Remarks
[illegible]	W	P	F	N						P	F	F	F	P														13/16	BUMPER BAR
[illegible]37	W	G	F	N						F	F	F	F	P														3/4	
[illegible]95	R	F	F	N						F	F	F	F	P														3/4	Insulated Rail for signal return.
[illegible]99	R	F	F	Y	HOLD DOWN	S	G	AF	G	G	F	F	F	P														1 ¼	
MASON	JACKSON CROSSING				OLD CASTING			WORN BADLY																				7/8	
1000	W	P	P	N						G	F	F	F	P														5/8	-1 1/8 Take Out
1001	R	P	P	Y	OB	2/S	F/P	2/ AF		F	F	F		G						F	I-F 1-P	F						1 1/8	Dep Beam
1009	R	F	F	N						F	F	F	F	G														3/4	
1018	W	G	G	N						G	G	G	G	F														3/4	
1025	W	G	G	Y	PA	S	G	BAB	G	F	G	G	G	G														13/16	Pulley turning slowly
1032	R	P	F	Y	PA	S	F	BAB	G	F	G	G	G	G														3/4	" " " "
1042	R	F	F	Y	URETH ALUM		G	AF	G	F	G	G	G	G														3/4	Not running rope off pulley-ureth
1049	R	F	F	N						F	G	G	G	G														13/16	
	TURN IN SWITCH				CAST TYPE		WORN OUT			WELDED FROG					SWITCH			MECHANICISM		WORN OUT		FRAME 6						
1059	Wood	F	F	N	access hatch										P	P	P	P		G									
1060	R	P	P	N						F	P	P	G	F														5/8	
1066	R	F	F	N						F	P	F	G	G														3/4	
1074	R	F	F	Y	PA	S	F	BAB	G	F	F	F	G	G														7/8	
1082	R	F	F	Y	PA	S	F	BAB	G	F	G	G	G	G														13/16	
1085	R	F	F	N						G	G	G	G	G														7/8	30"—leaves from tree
1094	Wood	F/P	G/G	Y	CR	Cl	F	BAB	G	P	P	F	G	F																

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Street: JACKSON From: TAYLOR To: JONES Inbound: Outbound X

Date 8/ 4/ 78

Catch No. JA	Inlet Cover:	Inlet Cover:	Catch Frame:	Pulley Present:	Pulley Type:	Pulley Material:	Pulley Condition:	Pulley Bearings:	Pulley Support:	Channel Condition:	Outside Rail:	Inside Rail:	Slot Rail:	Pavement Condition	Switch Rails:	Switch Tongue:	Gate Rails:	Frog Rails:	Slot Guides:	Slot Point:	Dep. Beam Frame:	Dep. Beam Pulleys:	Dep. Beam Anchor	Safety Latch Frame:	Safety Latch Tongue:	Turnbuckle Latch:	Gypsy Mechanism	Slot Width: (in fraction of in.)	Additional Remarks
1095	WOOD	F	G	H						P	P	F	G	G													3/4	
1099	R	F	P	N						F	F	F	G	F													13/16	
1100	R	F	F	Y	DB	2/S	F/F	2/ AF		F	G	G		F					F	F	P							
1101	R	F	F	Y	DB	2/S	F/F	2/ AF		F	G	G		F					F	F	P							1 pulley running
1110	R	P	F	N						F	G	G	G	G													13/16	
1119	R	P	F	N						F	G	G	G	F													13/16	Loose rail joint
1123	W	G	F	Y	PA	S	G	BAB	G	F	G	G	G	G													13/16	
1132	R	F	F	N						F	G	G	G	F													7/8	Loose rail joint
1140	C U RR I	G	G	N						F	G	G	G	G													3/4	URR COVER
1149	R	P	F	Y	PA	S	G	BAB	G	F	G	G	G	G													7/8	
1157	R	P	P	N						G	G	G	F	F													3/4	Loose rail joint
1165	CI	G	G	N						G	G	G	G	G													7/8	
1172	Wood Wood	F/F	G/G	Y	CR	CI	G	BAB	G	F	G	G	F	G													1 1/8	26" CROWN
1183	R	G	G	N						G	G	G	G	P													13/16	
1188	R	F	F	N						F	G	G	G	G													5/8	
1194	Wood Wood	G/G	G/G	Y	CR	CI	G	BAB	G	P	G	G	G	G													13/16	26" CROWN
1199	R	F	F	Y	PA	S	G	BAB	G	P	G	G	G	F													7/8	
1200	Wood Wood	F/F	G/G	Y	CR	CI	G	BAB	G	F	G	G	G	F													11/16	
1208	R	F	F	Y	PA	S	G	BAB	G	F	G	G	G	F													5/8	
1216	R	F	F	Y	URETH ALUM		G	AF	G	G	G	G	G	G													5/8	Eurethane/Alum
1222	R	P	F	N						G	G	G	G	G														

Street: JACKSON From: JONES To: LEVENWORTH Inbound: _____ Outbound X

Date 8 / 4 / 78

Hatch No.	Hatch Cover: Metal - CI, Steel	Hatch Cover: Cond. Good, Fair, Poor	Hatch Frame: Good, Fair, Poor	Pulley Present: Yes, No	Pulley Type: Cut Letters, Cut Numbers	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Outside Rail: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement: Good, Fair, Poor	Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Mate Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Point: Good, Fair, Poor	Dep. Beam Frame: Good, Fair, Poor	Dep. Beam Frame: Good, Fair, Poor	Dep. Beam Pulleys: Good, Fair, Poor	Dep. Beam Anchor: Good, Fair, Poor	Safety Latch: Good, Fair, Poor	Safety Latch Frame: Good, Fair, Poor	Safety Latch Tongue: Good, Fair, Poor	Turnable Latch: Good, Fair, Poor	Gypsy Mechanism: Good, Fair, Poor	Slot Width: (in fraction of in.)	Additional Remarks
230	R	P	F	N						G	G	G	G	P																7/8	Loose joint
242	R	P	F	Y	PA	S	G	BAB	G	F	G	G	G	F																13/16	
251	R	P	F	Y	PA	S	G	BAB	G	F	G	G	G	F																5/8	
259	W	P	F	Y	PA	S	F	BAB	G	F	G	G	G	G																3/4	
268	R	G	F	N						G	G	G	G	F																3/4	Bad joint
276	R	P	P	N						G	G	G	G	P																11/16	Broken welded slot joint
281	R	P	F	Y	PA	S	G	BAB	G	G	G	G	G	F																11/16	Noisy brng
291	R	P	P	N						F	G	G	G	G																3/4	
299	R	F	G	N						F	G	G	G	F																3/4	
300	WOOD	F/F	G/G	Y	CR	CI	G	Brass	G	F	G	G	G	F																1/2	20" Crown
308	R	P	P	N						G	F	G	G	P																13/16	Frame loose in pavement
315	R	P	P	N						G	P	F	P	P				Slow rail burned 5"												11/16	" " " " "
323	R	P	F	Y	PA	S	G	BAB	G	G	F	F	G	F																8/4	
333	R	F	F	N						G	F	F	G	F																3/4	Pavement between hatches - poor
345	R	P	F	Y	Ureth ALUMIN		G	AF	G	G	F	F	G	P																7/8	Rope running off center
5	R	P	P	N						G	F	F	G	P																7/8	
[illegible]	R	P	P	Y	PA	S	G	BAB	G	G	F	P	G	P																13/16	Slot rail joint BO
[illegible]	W	G	G	N						G	F	P	G	P																7/8	
[illegible]	W	G	G	Bumper bar tripped but pulley not turning against rope -Tar -																										1	Bumper Bar
[illegible]	W	G	G	Y	6"	S	P	Brass	G	G	F	F	G	G																1	
[illegible]	W	G	G	N						G	F	P	G	G																3/4	

Street: Jackson From: Levenworth To: Hyde Inbound: Outbound X

Date 8/4/78

Hatch No.	Hatch Cover: Bell, Riveted, CI, Wood	Hatch Cover: Good, Fair, Poor	Hatch Frame: Good, Fair, Poor	Curb Pulley: Yes, No	Pulley Type: Post, Lattice	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Outside Rail: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement Condition: Good, Fair, Poor	Switch Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Mate Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Point: Good, Fair, Poor	Dep. Beam Frame: Good, Fair, Poor	Dep. Beam Pulleys: Good, Fair, Poor	Dep. Beam Anchor Good, Fair, Poor	Safety Latch Frame: Good, Fair, Poor	Safety Latch Tongue: Good, Fair, Poor	Turntable Latch: Good, Fair, Poor	Gypsy Mechanism Good, Fair, Poor	Slot Width: (in fraction of in.)	Additional Remarks
JA 389	R	P	G	Y	PA	S	G	BAB	F	P	P	P	G	P															3/4	
		JACKSON HYDE CURVE												Did not check curve pulleys ---																23 curve
516	R	F	F	N						G	G	F	G	P															7/8	
518	W	G	G	N						G	G	F	G	P															7/8	Take out
524	W	G	G	N						G	G	G	-	P	G	G	G	G	G	G	(Needs some repair)								3/4	Needs new risers
530	R	F	F	Y	Ureth. Alumin		G	AF	G	G	F	F	G	P															3/4	
536	R	F	F	N						G	P	P	G	P															3/4	Old trilby rail
548	R	F	F	N						G	P	P	G	P															7/8	
560	R	F	F	Y	Ureth Alum		G	AF	G	G	P	P	G	P															3/4	
570	R	F	F	N						G	P	P	G	P															3/4	
580	R	F	F	N						F	P	P	G	P															3/4	
593	R	F	F	N						F	P	P	F	P															3/4	
600	Wood	F/F	G/G	Y	CR	CI	G	Bross	G	P	P	P	P	P															1¼	30" Crown
608	R	F	G	Y	WFR	CI	G	AF	G	G	P	P	G	F															7/8	Wide face regular pulley
16	R	F	F	N						G	P	P	G	P															5/8	
624	R	F	F	Y	Ureth Alumin		G	AF	G	G	P	P	G	F															3/4	
632	R	F	F	N						G	P	P	G	P															3/4	
640	R	F	F	Y	PA	S	G	BAB	G	G	P	P	G	F															3/4	
648	R	F	F	N						G	P	P	G	P															3/4	
656	W	F	F	N						G	P	P	P	F															7/8	
664	W	F	F	Y	DB	2/S	G/G	2/AP		G	P	P	F	P									G	G	F				3/4	

Street: WASHINGTON From: HYDE To: JONES Inbound: X Outbound

Date 6/2/76

Hatch No.	Hatch Cover: Type	Hatch Cover: Condition	Hatch Cover: Operation	Hatch Cover: Safety Pawls	Hatch Cover: Safety Pawls Present	Hatch Cover: Wire Rope Guards	Gen. Truck Fairlead: Material	Fairlead Truck Sheave: Condition	Fairlead Truck Sheave: Bearings	Pulley Bracket: Type	Pulley Bracket: Condition	Pulley Bracket: Bearings	Pulley Support: Type	Pulley Support: Condition	Gantry Block: Type	Gantry Block: Condition	Gantry Block: Bearings	Gantry Block: Sheave Pin	Gantry Block: Lock Pin	Gantry Block: Overall	Swivel Block: Type	Swivel Block: Condition	Swivel Block: Bearings	Swivel Block: Sheave Pin	Swivel Block: Lock Pin	Swivel Block: Overall	Hook Block: Type	Hook Block: Condition	Hook Block: Bearings	Hook Block: Sheave Pin	Hook Block: Lock Pin	Hook Block: Overall	Hook: Type	Hook: Condition	Hook: Safety Latch	Hook: Swivel	Hook: Bearings	Hook: Overall	Gypsy Mechanism: Type	Gypsy Mechanism: Condition	Gypsy Mechanism: Overall	Cut Width (at direction of Arm)	Additional Remarks
WA																																										
1422	R	F	P	Y	PA	S	G	BAB	F	P	G	G	G	F																												1/2	
1414	R	P	P	N						G	G	G	G	P																												5/8	
1408	R	P	F	N						G	G	G	G	F																												11/16	
1402	W	F	P	Y	CR	CA	G	BAB	G	P	G	G	G	F																												5/8	30 in.
1400	R	P	F	N						F	G	G	G	F																												5/8	
1399	R	F	F	N						F	G	G	P	P																												11/16	
1391	R	P	F	Y	DB	2 S	F F	2 AE		P	G	G		P																												1	
1385	R	P	P	N						G	G	G	G	P																												3/4	
1379	R	P	F	N						G	G	G	G	P																												11/16	
1371	R	P	F	Y	PA	S	G	BAB	G	F	G	G	G	F																												5/8	
1361	R	P	F	Y	PA	S	F	BAB	P	P	G	G	G	P																												5/8	
1351	R	P	P	N						G	G	G	G	P																												3/4	
1347	R	P	F	Y	PA	S	F	BAB	F	P	G	G	G	P																												7/8	
1339	R	P	F	N						G	P	G	G	P																												3/4	
1331	W	P	G	Y	CR	CA	G	BAB	G	P	G	G	G	P																												7/8	20 in.
1323	R	P	F	N						G	G	G	G	P																												3/4	
1317	R	P	F	Y	PA	S	F	BAB	P	P	G	G	G	P																												1 7/16	16 Rams High
1311	R	P	F	Y	PA	S	G	BAB	P	G	G	G	G	P																												7/8	
1303	R	P	F	Y	PA	S	F	BAB	G	P	G	G	G	P																												7/8	P.A. as Crow
1300	R	P	P	N						G	G	G	G	P																												11/16	Guard Rail
12-9	R	P	P	N						G	P	P	G	F																												7/8	

Street: WASHINGTON From: JONES To: TAYLOR Inbound: X Outbound

Date 8/10/78

| Batch No. WA | Patch Cover | Patch Cover Condition | Patch Cover Paint | Patch Grade | Patch Grade Paint | Patch Joint | Patch Joint Protection | Patch Material | Patch Material Condition | Patch Material Paint | Patch Support | Patch Support Condition | Patch Support Paint | Patch Support Type | Patch Support Material | Patch Support Material Condition | Patch Support Material Paint | Patch Support Material Type | Patch Support Material Size | Patch Support Material Size Unit | Patch Support Material Size Fraction | Patch Support Material Size Fraction Unit | Patch Support Material Size Fraction Unit Fraction | Patch Support Material Size Fraction Unit Fraction Unit | Patch Support Material Size Fraction Unit Fraction Unit Fraction | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit | Patch Support Material Size Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction Unit Fraction

Street: WASHINGTON From: TAYLOR To: MASON Inbound: -- Outbound

Date 8 /10 / 78

Hatch No.	Hatch Cover: Wood, Silver, Cl. Wood	Hatch Cover: Good, Fair, Poor	Hatch Frame: Good, Fair, Poor	Pulley Present: Yes, No	Pulley Type: Code Letters	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Outside Rail: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Mate Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Point: Good, Fair, Poor	Dep. Beam Frame: Good, Fair, Poor	Dep. Beam Pulleys: Good, Fair, Poor	Dep. Beam Anchor: Good, Fair, Poor	Safety Latch Frame: Good, Fair, Poor	Safety Latch Tongue: Good, Fair, Poor	Turnable Latch: Good, Fair, Poor	Gypsy Mechanism: Good, Fair, Poor	Slot Width: (in fraction of in.)	Additional Remarks
185	R	P	P	Y	PA	S	G	BAB	G	P	P	P	F	P															3/4	
181	R	P	P	Y	PA	S	F	BAB	F	G	P	P	F	P															7/8	
173	R	F	F	Y	PA	S	P	BAB	G	G	P	P	F	P															7/8	
165	R	F	P	N						G	P	P	F	P															1 1/8	
155	R	P	P	Y	URETHANE ALUM.	P	AF	P		G	P	P	P																5/8	
142	R	P	P	N						G	P	P	P	P															3/4	
134	R	P	P	N						G	P	P	G	P															13/16	
128	W	G	P	N						G	P	P	G	P															7/8	
122	R	F	P	N						G	P	P	P	P															7/8	
from car house															P	P	P	P		P									3/4	Pull-out switch
117	R	P	P	N						F	F	F	P	P															5/8	
112	R	P	D	N						F	F	F	P	P															1 1/16	
105	R	P	P	N						P	F	F	P	P															3/4	
103	R	P	P	N						P	F	F	P	P															1 1/8	
102	W	F	F	Y	CR	CI	F	BAB	G	P	F	F	P	P															7/8	
099	W	G	P	N						G	P	P		P															1 1/8	Take out

Street: WASHINGTON From: MASON To: POWELL Inbound: ___ Outbound: X

Date 5/18/78

| Hatch No. | Hatch Cover: Material | Hatch Cover: Condition | Hatch Cover: Type | Hatch Cover: Locking Device | Curb Type: Material | Curb Type: Condition | Curb Type: Flange Width | Curb Type: Flange Depth | Curb Type: Gutter Width | Curb Type: Gutter Depth | Curb Type: Gutter Slope | Curb Type: Gutter Material | Curb Type: Gutter Condition | Curb Type: Street Alum. | Curb Type: Expansion Joint | Curb Type: Joint Material | Curb Type: Joint Condition | Curb Type: Joint Width | Curb Type: Joint Depth | Curb Type: Joint Alum. | Curb Type: Joint Frame | Curb Type: Joint Support

Street: Hyde From: Beach To: North Point Inbound: x Outbound

Date 8 / 1 /78

Hatch No.	Hatch Cover: Weld Rivet, CI, Wood	Hatch Cover: Good Fair Poor	Hatch Frame: Good Fair Poor	Pulley Present: Yes No	Pulley Type: Code Letters	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Mate Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Beam Frame: Good Fair Poor	Dep. Beam Pulleys: Good Fair Poor	Dep. Beam Anchor Good Fair Poor	Safety Latch Frame: Good Fair Poor	Safety Latch Tongue: Good Fair Poor	Turnable Latch: Good Fair Poor	Gypsy Mechanism Good Fair Poor	Slot Width: Poor (in fraction of in.)	Additional Remarks
Hy Be	W	G	G	Y	Cr	Ci	G	AE	G	P	G	G	G	F															3/4	20 in. cr
2863	W	G	G	Y	Cr	Ci	G	AE	G	P	G	G	G	F															3/4	20 in. cr
2855	W	G	G	Y	Pa	S	F	BRS	G	P	G	G	G	F															7/8	Rope on side
2853	W	G	G	N						F	G	G	G	G															3/4	Sign. Pre-empt
2851	W	G	G	N						F	G	G	G	G															1	
2807	W	G	G	N						P	G	P	P	P															1	
2805	W	G	G	N						P	G	P	G	F															11/16	Sing. Return
2803	W	G	G	N						F	P	P	F	F															15/16	
2801	W	G	S	N						F	P	P	F	F															1	
2799	R	F	F	N						F	F	P	G	G															3/4	
2783	W	G	G	N						P	G	G	G	F															1	
2781	W/W	G/G	G/G	Y	2 DB	2 /S	G /G	2 /A		P	G	G	G	F							G	G	G						1 1/4	
	W	G	G	N						F	G	G	G	P															5/8	Pre-empt
2757	R	F	P	N						G	F	F	G	F															3/4	
2741	R	F	P	Y	PA	S	P	BAB	G	P	F	F	G	F															15/16	Dirt holding Pulley
2733	R	F	P	N						F	F	F	G	F															15/16	
2725	R	F	P	Y	DA	S	F	BAB	G	P	F	F	G	F															15/16	
2717	R	P	P	N						G	F	F	P	F															15/16	
2709	R	F	P	N						G	P	P	P	F															15/16	
2703	W/W	F/F	F/F	Y	CR	Ci	G	BAB	G	P	P	P	P	P															1 3/16	
2701	R	F	P	N						G	P	P	P	G															5/8	

Street: HYDE From: N. POINT To: BAY Inbound: X Outbound

Date 8/ 8/ 78

Hatch No. HY	Paint cover: Good Fair Poor	Hand Rails: Good Fair Poor	Gate cover: Good Fair Poor	Gate frame: Good Fair Poor	Pulley Fair Poor Present? Yes No	Pulley Type: Fixed Loose	Pulley Material: Cast Iron Steel Alum.	Pulley condition: Good Fair Poor	Pulley brackets: Good Fair Poor	Anti-Fr. Brass/Babb. Pulley supports: Good Fair Poor	Chain: Good Fair Poor	Cable: Good Fair Poor	Cable Guides: Good Fair Poor	Anchor pins: Good Fair Poor	Pavement: Good Fair Poor	Pavement condition: Good Fair Poor	Curb: Good Fair Poor	Curb condition: Good Fair Poor	Sidewalk: Good Fair Poor	Sidewalk condition: Good Fair Poor	Vault: Good Fair Poor	Vault condition: Good Fair Poor	Sign: Good Fair Poor	Sign: Points: Good Fair Poor	Sign: Frame: Good Fair Poor	Sign: Pulleys: Good Fair Poor	Safety cover: Good Fair Poor	Safety cover condition: Good Fair Poor	Gate: Good Fair Poor	Gate condition: Good Fair Poor		Additional Remarks
2689	W	P	G	N						F	P	P		P																	7/8	TAKE OUT
2681	W wood	F	G	Y	DB	2 S	G G	2 AF		P	P	P	P	P									G	G	F						1 1/8	
2673	R	F	P	N						G	P	P	P	G																	7/8	
2671	W	G	G	N						G	P	P	P	G																	15/16	SIGNAL RETURN
2665	R	F	P	N						G	P	P	P	F																	3/4	
2657	R	F	F	Y	PA	S	G	BRS	G	G	P	P	G	F																	7/8	ROPE HIGH
2649	R	F	D	N						G	F	F	P	F																	7/8	
2643	W	G	G	N						G	F	F	P	G																	7/8	PREMPT
2641	R	F	P	Y	PA	S	P	BAB	G	P	F	F	P	G																	3/4	PULLEY STUFFED
2633	R	P	P	N						G	F	F	P	F																	3/4	
2625	R	F	P	N						G	F	F	P	F																	7/8	
2617	R	F	P	Y	PA	S	G	BAB	G	G	F	F	G	F																	1	
2609	R	F	P	N						G	F	F	G	F																	13/16	
2605	wood wood	F	G	Y	CR	CI	F	BAB	G	P	P	P	P	F																	7/8	
2601	R	F	P	N						F	P	P	P	P																	7/8	
2597	R	P	P	N						G	P	P	P	F																	7/8	
2591	W	P	P	N						G	P	P	P	F																	7/8	
2589	R	P	P	N		2 S	G G	2 AF		G	P	P	P	G																	7/8	
2585	W wood	F	P	Y	DB	2 S	G G	2 AF		G	P	P		F									G	G	P						7/8	
2581	W wood	F	P	Y	DB	2 S	G G	2 AF		F	P	P		F									G	G	P						3/4	
2577	W	G	G	N						G	P	P	P	P																	15/16	SIGN RETURN

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Street: HYDE From: BAY To: CHESTNUT Inbound: X Outbound

Date 8/8/78

Hatch No.	Hatch Cover: Wood, Steel, CI, Wood	Hatch Cover: Good, Fair, Poor	Hatch Frame: Good, Fair, Poor	Pulley Present: Yes, No	Pulley Type: Rope, Letters	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Outside Rail: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Mate Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Point: Good, Fair, Poor	Dep. Beam Frame: Good, Fair, Poor	Dep. Beam Pulleys: Good, Fair, Poor	Dep. Beam Anchor: Good, Fair, Poor	Safety Latch Frame: Good, Fair, Poor	Safety Latch Tongue: Good, Fair, Poor	Turnable Latch: Good, Fair, Poor	Gypsy Mechanism: Good, Fair, Poor	Slot Width: (in fraction of in.)	Additional Remarks
HY																													
2565	R	F	P	N						G		P	P	F														1-5/16	
2557	R	F	P	Y	PA	S	G	BAB	G	P	P	P	P	G														1 5/16	
2549	R	F	P	N						F	P	P	P	F														7/8	
2547	W	G	G	N						G	P	P	P	F														1	Photograph
2547	W	G	G	N						G	P	P	P	F														1 1/4	"
2544	R	F	P	Y	PA	S	P	BAB	G	P	P	P	P	G															3/4	PULLEY LAYING INSIDE FRAME
2533	R	F	P	Y	PA	S	G	BAB	G	P	P	P	P	F															7/8	
2525	R	F	F	N						P	P	P	P	F															13/16	
2517	R	F	F	Y	PA	S	G	BAB	G	P	P	P	P	F															7/8	
2509	R	F	F	Y	PA	S	G	BAB	G	P	P	P	P	F															7/8	
2501	R	F	F	N						G	P	P	P	F															1	
2489	R	F	F	N						G	P	P	P	F															7/8	
2483	R	F	F	N						G	P	P	P	P															7/8	
2475	R	F	F	N						G	P	P	P	P															3/4	
2467	R	F	P	Y	URETHANE ALUM.		G	AF	G	G	P	P	P	F															7/8	
2459	R	F	F	Y	"		G	AF	G	G	P	P	P	F															7/8	
2457	R	F	F	N						G	P	P	P	P															1	
2446	R	F	F	N						G	P	P	P	P															7/8	
2441	R	F	F	Y	URETHANE ALUM.		G	AF	G	P	P	P	P	P															5/16	
2433	R	F	F	N						G	P	P	P	P															7/8	
2425	R	F	P	Y	PA	S	F	BAB	G	P	P	P	P	P															1 1/16	

Street: HYDE From: CHESTNUT To: LOMBARD Inbound: X Outbound

Date 8/8/78

Hatch No. HY	Hatch Cover: Wood, Rings, CI, Wood	Hatch Cover: Good, Fair, Poor	Hatch Frame: Good, Fair, Poor	Pulley Present: Yes, No	Pulley Type:	Code Letters	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-Fr., Brass, Babbit	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Curbside Rail: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement Condition: Good, Fair, Poor	Switch Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Gate Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Point: Good, Fair, Poor	Dep. Beam Frame: Good, Fair, Poor	Dep. Beam Pulleys: Good, Fair, Poor	Dep. Beam Anchor: Good, Fair, Poor	Safety Latch: Good, Fair, Poor	Safety Latch Frame: Good, Fair, Poor	Safety Latch Tongue: Good, Fair, Poor	Gipsy Mechanism: Good, Fair, Poor	Gipsy Mech.: Good, Fair, Poor	Width: (in fraction of an in.)	Additional Remarks
2417	R	F	P	N						F	P	P	P	P										G	G				1 1/8	
2413	W	F	F	N						F	P	P	P	P															3/4	20 in.cr.
2409	R wood	F	F G	Y	CR	CI	F	BAB	G	P	P	P	P	P										G	G				1	
2407	W	G	G	N						F	P	P	G	F															3/4	20 in. cr.
2405	R wood	F	F F	Y	CR	CI	G	BAB	G	P	F	P	P	P															3/4	
2401	R	F	P	N						G	P	P	P	P															7/8	
2395	R wood	F	P P	N		2/	G	2		F	P	P	P	P										G	G	P			7/8	
3497	W wood	F	F P	Y	DB	S	G	/AP		F	P	P		P															1 1/8	
2383	R	F	F	N						G	P	P	P	P															15/16	
2323	R	F	P	N						G	P	P	P	P															1	
2363	R	F	P	N						F	P	P	P	P															7/8	
2353	R	F	P	Y	PA	S		BAB	G	P	P	P	P	P															3/4	
2343	R	F	R	N						F	P	P	G	P															3/4	
2335	R	F	P	N						G	P	P	P	P															1 1/16	
2327	R	F	P	N						G	P	P	P	P															3/4	
2319	R	F	P	Y	PA	S	F	BAB	G	P	P	P	P	P															1 3/16	
2511	R	F	F	N						G	P	P	P	P															1 3/16	
2305	R wood	P	P P	Y	CR		G	BAB	G	P	P	P	P	P															3/4	30 in cr.
2301	R wood	F	P P	Y	CR	CI	G	BAB	G	P	P	P	P	F															3/4	
2297	R	F	F	N						F	P	P	P	F															3/4	Rope high
2287	R	F	P	N						G	P	P	P	P																	

Street: HYDE From: LOMBARD To: GREENWICH Inbound: X Outbound

Date 8/ 8/ 78

Hatch No. HY	Hatch Cover: Weld, Rivet, CI, Wood	Hatch Cover: Good Fair Poor	Hatch Frame: Good Fair Poor	Pulley Present: Yes No	Pulley Type: Code Letters	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Mate Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Beam Frame: Good Fair Poor	Dep. Beam Pulleys: Good Fair Poor	Dep. Beam Anchor Good Fair Poor	Safety Latch Frame: Good Fair Poor	Safety Latch Tongue: Good Fair Poor	Turntable Latch: Good Fair Poor	Gypsy Mechanism Good Fair Poor	Slot Width: (in fraction of in.)	Additional Remarks
2277	R	F	P	N						G	P	P	P	F															7/8	
2267	R	F	P	N						G	P	P	P	F															3/4	
2257	R	F	P	Y	PA	S	G	OSS	G	G	P	P	P	F															3/4	Rope High
2247	R	F	F	N						G	P	P	G	F															3/4	
2239	R	F	P	Y	PA	S	G	BAB	G	P	P	P	P	F															11/16	
2231	R	F	F	N						G	P	P	P	G															7/8	
2223	R	F	P	Y	Urethane Alum.		G	AF	G	F	P	P	G	F															7/8	
2215	R	F	P	N						G	P	P	P	F															1	
2213	R	F	P	Y	PA	S	G	BAB	G	F	P	P	P	F															3/4	
2209	R	F	F	Y	PA	S	G	BAB	G	F	P	P	P	F															7/8	Rope High
2205	R	F	P	Y	Urethane Alum.		G	AF	G	P	P	P	P	F															3/4	
2201	R	F	P	Y	PA	S	G	BAB	G	P	P	P	P	F															7/8	Rope High
2195	R	F	P	N						G	P	P	P	P															7/8	
2187	R	F	P	N						G	P	P	P	F															3/4	Rope High
2179	R	F	F	N						G	P	P	P	F															3/4	Rope High
2171	R	F	P	N						G	P	P	P	E															7/8	
2163	R	F	P	N						G	P	P	P	F															3/4	
2155	W	F	F	Y	PA	S	F	BRS	G	F	P	P	P	F															13/16	
2147	R	F	P	Y	PA	S	P	AF	G	P	F	F	P	F															3/4	
2143	R	F	P	Y	PA	S	P	AF	G	F	F	F	P	F															11/16	
2139	R	F	P	N						G	F	F	P	F															11/16	

Street: HYDE From: GREENWICH To: UNION Inbound: X Outbound

Date 8 / 8 / 78

Hatch No. HY	Hatch Cover: Weld Patch, CI, Wood	Hatch Cover: Good Fair Poor	Hatch Frame: Good Fair Poor	Pulley Present: Yes No	Pulley Type: Horiz Lifters	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr., Brass/Babb.	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Mate Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Beam Frame: Good Fair Poor	Dep. Beam Pulleys: Good Fair Poor	Dep. Lock Anchor Good Fair Poor	Safety Latch Frame: Good Fair Poor	Safety Latch Tongue: Good Fair Poor	Turnbuckle Bracket: Good Fair Poor	Gypsy Wheel: Good Fair Poor	Slot Width: (in fraction of in.)	Additional Remarks
2135	R	F	P	Y	PA	S	F	BAB	G	P	P	F	P	P															3/4	
2131	R	F	P	Y	PA	S	G	BAB	G	F	P	F	P	F															3/4	
2125	R	F	P	N						G	P	P	P	P															7/8	
2117	R	F	P	N						F	P	P	P	P															3/4	
2109	R	F	P	N						F	P	P	P	P															13/16	
2103	W	P	P	Y	DB	2 S	P	2 AF		F	P	P		P						G	P	P							7/8	One pulley stil
2101	R	F	P	N						G	P	P	P	F															7/8	
2089	R	F	F	N						G	P	P	G	F															7/8	
2079	R W	F F	F P	Y	CR	CI	F	BAB	G	P	P	P	G	F															7/8	
2069	R	F	F	Y	PA	S	P	BAB	P	F	P	P	G	F															7/8	
2059	R	F	F	N						G	P	P	G	P															3/4	
2049	R	F	F	Y	PA	S	G	BAB	G	G	P	P	P	F															7/8	
2041	R	F	F	N						G	P	P	P	F															3/4	
2033	R	F	F	N						G	P	P	P	P															7/8	
2025	R	F	P	N						G	P	P	P	P															3/4	
2017	R	F	F	Y	BA	S	F	BRS	G	G	P	P	P	F															5/8	
2009	R	F	F	N						G	P	P	P	P															3/4	
2003	W wood	F F	P D	Y	DB	2 S	P	2 AF		F	P	P		P						G	P	P							1 3/16	
2001	W	P	G	N						G	P	P		P															3/16	Take out
1993	R	F	F	N						G	F	F	P	F															7/8	
1985	R	F	F	Y	PA	S	F	BAB	F	F	P	P	P	F															5/8	

Street: HYDE From: UNION To: GREEN Inbound: X Outbound

Date 8/ 9/ 78

Match No.	Match Cover: Weld Rivet, CI, Wood	Match Cover: Good Fair Poor	Match Frame: Good Fair Poor	Pulley Present: Yes No	Pulley Type: Hole Letters	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr., Brass/Bab.	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Mate Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Beam Frame: Good Fair Poor	Dep. Beam Pulleys: Good Fair Poor	Dep. Beam Anchor Safety: Good Fair Poor	Safety Latch Frame: Good Fair Poor	Safety Latch Tongue: Good Fair Poor	Turnable Latch: Good Fair Poor	Gypsy Mechanism: Good Fair Poor	Curb Angle: (in fraction of in.)	Additional Remarks
HY																													
197	WOOD	F	G	Y	CR	CI	G	BAB	G	P	P	P	P	F														7/8	36 in.
197	R	F	P	N						G	P	P	P	F														11/16	
1963	R	F	F	N						F	P	P	P	F														3/4	
1955	R	F	P	Y	PA	S	F	BAB	F	F	P	P	P	F														1/2	
1947	R	F	F	Y	URETHANE ALUM		G	AF	G	F	P	P	P	P														15/16	
1939	R	F	F	N						G	P	P	P	F														7/8	
1931	R	F	P	N						G	P	P	P	F														7/8	
1923	R	F	P	Y	PA	S	P	BAB	P	G	P	P	P	F														13/16	
1917	R	F	F	N						G	P	P	P	F														3/4	
* 1907	R	F	F	N						G	P	P	P	F														7/8	
* 1907	W WOOD	P P	P P	Y	DB	2 S	G G	2 AF		F	P	P		P						G	G	P						8/10	
1893	R	F	P	N						G	P	P	P	P														7/8	
1883	R	F	D	N						G	P	P	P	P														3/4	
1881	R	F	P	N						F	P	P	P	F														3/4	
1879	R	F	R	Y	PA	S	G	BAB	G	F	P	P	P	F														3/4	
1871	R	F	F	N						G	P	P	P	F														3/4	
1865	R	F	P	N						G	P	P	P	F														11/16	
1855	R	F	P	Y	URETHANE ALUM.		G	AF	G	G	P	P	P	P														13/16	
1847	R	F	P	N						G	P	P	P															3/4	
1839	R	F	F	N						G	P	P	P	F														7/8	
1831	R	F	F	Y	PA	S	F	BAB	F	F	P	P	P	P														7/8	

Street: HYDE From: GREEN To: BROADWAY Inbound: X Outbound

Date 8/ 9/ 78

Hatch No.	Hatch Cover: Wood, Steel, CI, Mixed	Hatch Cover: Good, Fair, Poor	Hatch Frame: Good, Fair, Poor	Pulley Present: Yes, No	Pulley Type: Cast Iron, Steel, Alum.	Pulley Material: CI, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Outside Rail: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Points: Good, Fair, Poor	Mate Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Points: Good, Fair, Poor	Dep. Ecc. Frame: Good, Fair, Poor	Dep. Ecc. Pulleys: Good, Fair, Poor	Dep. Ecc. Anchor: Good, Fair, Poor	Safety Latch Frame: Good, Fair, Poor	Safety Latch Tongue: Good, Fair, Poor	Turntable Latch: Good, Fair, Poor	Gypsy Mechanism: Good, Fair, Poor	Slot Width: (in fraction of in.)	Additional Remarks
623	R	F	P	N						G	P	P	P	P														11/16	
615	R	F	P	Y	RA	S	G	BRS	G	G	P	P	P	F														1/2	
607	R	F	F	W						G	P	P	P	F														15/16	
601	R	F	F	N						G	P	P	P	G														7/8	
597	A	F	P	N						G	P	P	P	F														3/4	
584	R	F	F	N						G	P	P	G	P														7/8	
583	R/W	F/F	P/D	Y	CR	CI	G	BAB	G	P	P	P	G	P														5/8	20 in. Cr.
579	R	F	F	N						G	P	P	G	P														7/8	
569	R	F	F	Y	PA	S	G	BAB	F	F	P	P	G	F														7/8	
559	R	F	F	Y	URETHANE ALUM		G	AF	P	F	P	P	G	F														15/16	
551	R	F	F	N						F	P	P	P	F														15/16	
543	R	F	P	Y	URETHANE ALUM		G	AF	P	P	P	P	P	F														3/4	
535	R	F	P	Y	PA	S	G	BAB	P	F	P	P	G	F														15/18	Rope high
535	R	F	N	N						F	P	P	G	F														7/8	
517	R	F	P	Y	R	CI	F	BRS	G	P	P	P	P	F														7/8	light
503	R	F	P	N						G	P	P	G	F														7/8	
501	W/W	F/F	F/F	Y	DB	2/S	F/F	2/AF		P	P	P		P						G	F	P						7/8	
473	W	G	G	N						F	F	F	G	G														1 1/8	Take out
451	W/W	G/G	F/F	Y	DB	2/S	G/G	2/AF		F	F	F	G	P						G	G	P						3/4	
055	R	F	P	N						G	P	P	F	F														3/4	
47	R	F	P	Y	PA	F	G	BRS	G	P	P	P	G	P														13/16	Rope high

Street: HYDE From: BROADWAY To: PACIFIC Inbound: X Outbound

Date 8 / 9 / 78

Batch No. HY	Patch Cover	Wire Pulley Cover Patch	Pulley Cover Condition	Pulley Cover Paint	Pulley Cover Present	Pulley Type	Pulley Material	Pulley Condition	Pulley Paint	Pulley Coating	Pulley Bearings	Pulley Bearings Condition	Pulley Bearings Paint	Pulley Bearings Coating	Pulley Bolts	Pulley Bolts Condition	Pulley Bolts Paint	Pulley Bolts Coating	Pulley Shaft	Pulley Shaft Condition	Pulley Shaft Paint	Pulley Shaft Coating	Pulley Guard	Pulley Guard Condition	Pulley Guard Paint	Pulley Guard Coating	Pulley Guard Present	Pulley Guard Type	Pulley Guard Material	Pulley Guard Condition	Pulley Guard Paint	Pulley Guard Coating	Gypsie Head	Gypsie Head Condition	Gypsie Head Paint	Gypsie Head Coating	Gypsie Head Present	Gypsie Head Type	Gypsie Head Material	Gypsie Head Condition	Gypsie Head Paint	Gypsie Head Coating	Sheave Diameter	Additional Remarks
1639	R	F	P	Y	URETHANE ALUM.		G	AF	G	P	P	P	G	P																												7/8	
1637	N	G	G	N						G	P	P	P	F																												7/8	Sign placement
1631	R	F	F	Y	PA	S	G	BAB	F	P	P	P	P	P																											7/8	Light Rope
1623	R	F	F	Y	PA	S	P	BAB	P	P	P	P	P	P																											15/16	Pulley Not Working
1615	R	F	P	N						G	P	P	G	F																												7/8	
1607	R	F	P	Y	PA	S	F	BAB	F	F	P	P	G	F																												7/8	
1601	W	F	F	Y	CR	CI	F	BAB	G	F	F	F	F	F																												1 3/8	36 in.
1597	R	F	F	Y	PA	S	F	BAB	P	P	P	P	P	P																												7/8	Rope High
1579	R	F	P	N						G	P	P	P	P																												7/8	
1575	W	G	G	N						G	P	P	G	F																												9/16	
1571	W	G	G	Y	HD URETHANE ALUM.	LI	G	AF	G	G				G																												Hold down
1569	R	F	P	Y			G	AF	P	P	P	P	G	F																												7/8	
1567	W	G	G	N	BLIND CHAN.					G				G																													
1565	W	G	G	N	BLIND CHAN.					G				G																													
1551	W	G	G	Y	CR	CI	G	AF	G	G				G																												20 in.
1559	R	F	F	N						G	P	P	G	F																												1 13/16	
1547	R	F	P	Y	PA	S	F	BAB	P	P	P	P	G	P																												3/4	Rope high
1545	W	G		N						G	G	F	G	F																												3/4	
1539	W	G	G	N						G	F	F	G	G																											G	1 1/8	Gypsie for Ca
1537	W	G	G	Y	URETHANE ALUM.		F	AF	G	P	G	G	G	P																												13/16	
										PACIFIC AVE.,					P	G	G	F	G	G																				

Street: HYDE From: PACIFIC To: JACKSON Inbound: X Outbound:

Date 8 / 9 /78

| Hatch No. | Hatch Cover: Wood, Plywood, Ct. Wood | Hatch Cover: Paint | Hatch Cover: Paint | Hatch Cover: Paint | Pulley Type: Wood, Cast Iron, Steel, Alum. | Pulley Type: Wood, Cast Iron, Steel, Alum. | Pulley Type: Wood, Cast Iron, Steel, Alum.

Street: HYDE From: JACKSON To: WASHINGTON Inbound: X Outbound

Date 8 / 9 / 78

| Hatch No. Hy | Hatch Cover: Hatch Plywood Sheathing | Hatch Cover: Hatch Plywood Sheathing Condition: Good Fair Poor | Hatch Cover: Hatch Frame: Good Fair Poor | Hatch Cover: Hatch Frame Presently: Painted Yes No | Pulley Type: Pulley Material: Cast Iron Steel Alum. | Pulley Type: Pulley Condition: Good Fair Poor | Pulley Type: Anti-Friction Bearings: Yes No | Pulley Support: Bracket Condition: Good Fair Poor | Pulley Support: Bracket Condition: Good Fair Poor | Pulley Support: Bracket Condition: Good Fair Poor

Street: Hyde From: Washington To: Sacramento Inbound: _____ Outbound X

Date 8/20/78

Hatch No. HY	Patch Cover: Type	Patch Cover: Cond.	Patch Cover: Fair Wear	Pulley Trace: Cond.	Pulley Present:	Pulley Type:	Pulley Material:	Pulley Condition:	Pulley Bearings:	Pulley Support:	Channel Condition:	Frame Fair	Cut Fair	Slot Fair	Pavement Cond. Fair	Switch Points: Cond.	Switch Torque: Cond.	Pole Paint: Cond.	Trol Paint: Cond.	Slot Guides: Cond.	Slot Trace: Cond.	Rep. Brac Cond.	Rep. Brac Cond.	Pulleys: Cond.	Safety Anchor Cond.	Safety Latch Cond.	Safety Latch Trace Cond.	Cable: Cond.	Cable Mechanics: Cond.	Additional Remarks
1371	R	F	P	N						P	F	F	G	P															3/4	
1363	R	F	F	N						G	F	F	G	G															3/4	
1353	R	F	F	N						G	F	F	G	G															7/8	
1347	R	F	F	N						G	F	F	G	F															3/4	
1341	R	F	F	Y	PA	S	G	Bab	P	P	F	F	G	G															7/8	
1333	R	F	F	Y	PA	S	G	Bab	G	F	F	F	G	G															3/4	
1327	R	F	P	Y	PA	S	G	Bab	G	F	F	F	P	G															1 3/16	
1319	R	F	F	N						G	F	F	G	G															3/4	
1313	R	F	F	N						G	F	F	P	G															11/16	
1307	R	F	P	N						G	F	F	G	G															7/8	
1303	wood/ wood	G/G	G/G	Y	CR	CI	G	Bab	G	P	F	F	P	G															7/8	30° CR
1301	W	G	P	N						G	F	F		F															1	Take out
1285	R	F	F	N						G	F	F	P	P															1	
1275	wood/ wood	G/G	G/G	Y	CR	CI	G	Bab	G	P	F	F	F	G															3/4	30° CR
1265	R	F	F	N						G	F	F	G	G															7/8	
1255	R	F	F	Y	Urethane Alum.		F	AF	P	G	F	F	P	G															9 7/16	
1251	R	F	P	N						G	F	F	P	G															5/8	
1241	R	F	P	Y	PA	S	G	Bra	G	G	F	F	G	G															11 7/16	
1233	R	F	F	N						G	F	F	P	G															9 7/16	
1227	R	F	F	Y	PA	S	G	Bab	G	F	F	F	P	G															7/8	
1221	R	F	P	Y	PA	S	F	Bab	G	G	F	F	P	G															3/4	Pulley dragging

Street: Hyde From: Sacramento To: California Inbound: Outbound X

Date 8/ 28/78

Hatch No.	Hatch Cover: Very Poor/Fair/Good	Hatch Cover: Poor/Fair/Good	Hatch Frame: Poor/Fair/Good	Pulley Present: Yes/No	Pulley Type: Cover/Open	Pulley Material: Cast Iron/Steel/Alum.	Pulley Condition: Poor/Fair/Good	Pulley Bearings: Poor/Fair/Good	Anti-Fr. brg.? Bab.	Pulley Supports: Poor/Fair/Good	Channel Condition: Poor/Fair/Good	Outside Rail: Poor/Fair/Good	Inside Rail: Poor/Fair/Good	Slot Rail: Poor/Fair/Good	Pavement Condition: Poor/Fair/Good	Switch Rails: Poor/Fair/Good	Switch Tongue: Poor/Fair/Good	Gate Rails: Poor/Fair/Good	Frog Rails: Poor/Fair/Good	Slot Guides: Poor/Fair/Good	Slot Point: Poor/Fair/Good	Dep. Beam Frame: Poor/Fair/Good	Dep. Beam Pulleys: Poor/Fair/Good	Dep. Beam Kicker Poor/Fair/Good	Safety Latch Poor/Fair/Good	Safety Latch Frame: Poor/Fair/Good	Safety Latch Torque Tube: Poor/Fair/Good	Gypsy Wedge: Poor/Fair/Good	Gypsy Wedge Pin: Poor/Fair/Good	Gypsy Wedge Pin Diam. (in fraction of in.)	Additional Remarks
Hy																																
1215	R	F	F	N						G	F	F	P	G																3/4	
1201	W/ WOOD	P/F	P/F	Y	DB	2/S	G/G	2/ AF		P	F	F		P								G	G	P						3/ 8	
1175	WOOD	F/F	G/G	Y	CR	CI	F	Bab	G	P	F	F	P	G																11/ 16	
1169	R	F	F	N						G	F	F	P	F																3/4	
1161	R	F	F	N						G	F	F	G	G																7/8	
1151	R	F	P	Y	PA	S	F	Bab	G	G	F	F	P	G																7/8	
1143	R	F	P	N						F	F	F	G	G																7/8	
1135	R	F	F	Y	PA	S	F	Bab	G	F	F	F	G	G																3/4	Drag scraking
1127	R	F	F	Y	PA	S	G	Bab	G	P	F	F	P	G																3/4	
1119	R	P	F	N						G	F	F	P	G																3/4	
1111	R	P	P	N						G	F	F	P	G																17/ 16	
1103	R	F	F	N						F	F	F	P	G																17/ 16	
1101	4/W	4/G	4/G	N						P	G	G	G	G																1	Bumper bar

Street: Hyde From: California To: Clay Inbound: X Outbound

Date 6/28/78

Manhole No.	Manhole Cover Condition	Manhole Cover Fit	Manhole Cover Type	Gutter Line Trace	Gutter Line Type	Valley Present	Valley Type	Valley Condition	Valley Material	Valley Trace	Valley Condition	Pavement Condition	Pavement Type	Pavement Condition	Curb Condition	Curb Type	Curb Condition	Gutter Condition	Gutter Type	Gutter Condition	Slot Trace	Slot Type	Slot Condition	Slot Point Trace	Slot Point Type	Slot Point Condition	Rep. Base Trace	Rep. Base Type	Rep. Base Condition	Safety Lock Trace	Safety Lock Type	Safety Lock Condition	Catch Trace	Catch Type	Catch Condition	Gutter Width (in fraction of ft.)	Additional Remarks
1104	R	G	G	N						G	G	G	G	F																					7/8	
1110	R	P	P	N						G	F	F	G	F																					3/4	
1120	R	P	P	Y	PA	S	F	Bab	G	F	F	F	P	F																					11/16	
1126	R	P	P	Y	PA	S	F	Bab	F	F	F	F	P	F																					3/4	
1136	R	P	P	Y	PA	S	F	Bra	F	P	F	F	P	F																					3/4	Bumps Skateboard
1144	R	P	P	N						G	F	F	P	F																					7/8	
1152	R	P	P	N						F	F	F	P	F																					1	
1162	R	P	P	Y	PA	S	G	Bra	G	F	F	F	P	G																					1 1/16	
1168	[illegible]	F	G/G	Y	CR	CI	F	Bab	G	F	F	F	P	G																					13/16	30" CR
1176	[illegible]	G/G	G/G	Y	PA	S	F	Bab	G	P	F	F	P	F																					3/4	9" Crown
1186	R	P	P	N						G	F	F	P	F																					7/8	
1196	R	P	P	N						G	P	P	P	P																					3/4	
1202	[illegible]	F	G/G	Y	DR Urethane	2/S Alum.	G/G	27 AF		F	F	F		P										G	G	G									7/8	
1216	R	P	P	Y			G	AF	G	G	F	F	P	G																					13/16	Rope high
1222	R	P	P	Y	PA	S	G	Bab	F	G	F	F	G	G																					1 1/16	
1226	R	P	P	N						G	F	F	P	F																					1 1/16	
1234	R	P	P	Y	PA	S	G	Bab	G	G	P	F	P	F																					[illegible]	
1242	R	P	P	N						G	F	F	G	P																					1 1/16	
1252	R	P	P	N						G	F	F	G	P																					3/4	
1256	R	P	P	N						G	F	F	G	F																					3/4	
1266	R	P	P	Y	PA	S	G	Bra	G	G	F	F	G	G																					1/2	

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Street: Hyde From: Clay To: Washington Inbound: X Outbound

Date 8/28/78

Hatch No. HY	Hatch Cover: Wood, Steel, Cl. Wood	Hatch Cover: Hatch Frame: Good, Fair, Poor	Pulley Present: Yes, No	Pulley Type: Pole Letters	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-fr., Brass, Babb.	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Outside Rail: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement Condition Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Mate Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Point: Good, Fair, Poor	Dep. Beam Frame: Good, Fair, Poor	Dep. Beam Pulleys: Good, Fair, Poor	Dep. Beam Anchor Good, Fair, Poor	Safety Latch Poor Good, Fair, Poor	Safety Latch Frame: Good, Fair, Poor	Turnable Tongue: Good, Fair, Poor	Gypsy Mechanism Good, Fair, Poor	Slot Width: (in fraction of in.)	Additional Remarks
1276	wood/wood	G/G	G/G	Y	CR	CI	F	Bra	G	F	F	F	G	G														13/16	20" CR
1280	W	G	F	N						G	F	F		P														3/4	Take out
1286	R	P	P	N						G	F	F	P	P														7/8	
1304	wood/wood	G/G	F/F	Y	CR	CI	G	Bab	G	P	F	F	G	P														7/8	20" CR
1308	R	P	P	N						G	F	F	G	G														3/4	
1314	R	F	P	Y	PA	S	G	Bra	G	F	F	F	G	G														13/16	
1320	R	F	P	N						G	F	F	G	G														13/16	
1328	R	F	F	Y	PA	S	G	Bra	G	G	F	F	G	G														11/16	
1334	R	F	P	Y	PA	S	G	Bra	G	G	F	F	P	G														3/4	
1342	R	F	P	Y	PA	S	G	Bra	G	G	F	F	P	G														11/16	
1348	R	F	F	N						F	F	F	P	G														13/16	
1354	R	F	P	Y	PA	S	P	Bra	G	P	F	F	P	G														3/4	Pulley stopped
1364	R	F	F	N						F	F	F	G	G														3/4	
1372	R	F	P	N						F	F	F	G	G														3/4	
1376	W	G	F	N						G	F	F		F														11/16	Take out
1378	wood/wood	G/G	G/G	Y	CR	CI	G	Bab	G	G	F	F	G	G														7/8	20" CR
1400	4/WH	G	4/G	N						P	F	F	G	G				Water in pit										7/8	Bumper bar tripped Rope cutting pulley-stopped

Street: HYDE From: BROADWAY To: GREEN Inbound: _____ Outbound X

Date 8 / 4 / 78

Catch No.	Catch Covers: Material	Catch Covers: Condition	Pulley Present: Yes/No	Pulley Material: Cast Iron/Steel/Alum.	Pulley Condition: Good/Fair/Poor	Anti-Fr. Bearings: Yes/No	Pulley Support: Brass/Babb.	Channel Condition: Good/Fair/Poor	Outside Rail: Good/Fair/Poor	Inside Rail: Good/Fair/Poor	Pavement: Good/Fair/Poor	Switch Rails: Good/Fair/Poor	Switch Tongue: Good/Fair/Poor	Gate Rails: Good/Fair/Poor	Frog Rails: Good/Fair/Poor	Slot Lugs: Good/Fair/Poor	Slot Point: Good/Fair/Poor	Dep. Beam Frame: Good/Fair/Poor	Dep. Beam Pulleys: Good/Fair/Poor	Dep. Beam Anchor: Good/Fair/Poor	Safety Latch: Good/Fair/Poor	Safety Latch Frame: Good/Fair/Poor	Safety Latch Tongue: Good/Fair/Poor	Gypsy Latch: Good/Fair/Poor	Slot Width: Good/Fair/Poor (in fraction of in.)	Additional Remarks
HY																										
676	W	G	G	Y	4"	S	P	BRA	P	P	F	F	G	G											1 1/16	Take Out
700	W	F	F	Y	DB	2/S	G/P	2/ AF		G	F	F	F	F						G	G/P	F				3/4	Second pulley BO
704	R	F	F	N						G	F	F	G	P												11/ 16	
710	R	F	F	N						G	F	F	G	P												7/8	
718	R	F	F	N						G	P	P	G	P												7/8	
726	R	F	F	Y	Urethene Alumin		G	AF	G	G	P	F	G	F												3/4	
736	R	F	F	N						G	F	F	G	P												3/4	
744	R	F	F	N						G	F	F	G	P												7/8	
752	R	F	F	Y	PA	S	G	BAB	G	G	F	F	G	P												7/8	
760	R	F	F	N						G	F	F	G	P												1	
770	R	F	F	N						G	F	F	G	F												7/8	
780	R	F	F	Y	PA	S	F	BAB	F	P	F	F	G	F												7/8	
784	Wood Wood	F/F	GG	Y	CR	CI	G	BAB	G	F	F	F	F	P												7/8	21" Crown
790	R	F	F	N						F	F	F	G	P												3/4	
798	R	F	F	Y	PA	S	F	BAB	G	F	F	F	G	F												7/8	
802	R	F	F	Y	R	CI	P	BAB	G	F	F	F	G	F												7/8	
808	R	F	F	N						G	P	P	G	P												7/8	
816	R	F	F	N						G	P	P	G	F												7/8	
824	R	F	F	Y	PA	S	G	BAB	G	F	P	P	G	F												1	
832	R	F	F	N						G	P	F	G	F												3/4	
840	R	F	F	Y	PA	S	G	[illegible]	G	G	P	F	G	P												15/ 16	

Street: HYDE From: GREEN To: UNION Inbound: _____ Outbound X

Date 8/ 4/ 78

Hatch No.	Hatch Cover: Wood-Covered, Cl. Wood / Metal-Covered, Alum.	Hatch Cover: Good / Fair / Poor	Hatch Fitters: Good / Fair / Poor	Pulley Present: Yes / No	Pulley Type: Pole Fitters / Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good / Fair / Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good / Fair / Poor	Channel Condition: Good / Fair / Poor	Outside Rail: Good / Fair / Poor	Inside Rail: Good / Fair / Poor	Slot Rail: Good / Fair / Poor	Pavement Condition: Good / Fair / Poor	Switch Rails: Good / Fair / Poor	Switch Tongue: Good / Fair / Poor	Mate Rails: Good / Fair / Poor	Frog Rails: Good / Fair / Poor	Slot Guides: Good / Fair / Poor	Slot Point: Good / Fair / Poor	Dep. Beam Frame: Good / Fair / Poor	Dep. Beam Pulleys: Good / Fair / Poor	Dep. Beam Anchor: Good / Fair / Poor	Safety Latch Frame: Good / Fair / Poor	Safety Latch Tongue: Good / Fair / Poor	Turnable Latch: Good / Fair / Poor	Gypsy Mechanism: Good / Fair / Poor	Slot Width: (in fraction of in.)	Additional Remarks
HY																												
348	R	F	F	Y	PA	S	G	BAB	G	F	F	F	G	F														7/8	
356	R	F	P	N						G	P	F	G	P														7/8	
366	R	F	F	Y	Urethene Alumin		G	AF	G	F	F	F	G	F														3/4	
372	R	F	F	N						F	F	F	G	G														3/4	
380	R	F	F	Y	Urethene Alumin		G	AF	G	G	F	F	G	G														5/8	
382	R	F	F	Y	PA	S	G	BAB	G	G	P	F	G	G														3/4	Rope running high
384	R	F	F	Y	PA	S	G	BAB	G	G	P	F	G	G														3/4	Pulleys not in contact
394	R	F	F	N						G	P	F	G	F														7/8	
900	R/W	P/P	P/P	Y	DB	2/S	G/G	2/ AF		G	F	F	P	F						F	G	P						3/4	
908	R	F	F	N						G	F	F	G	F														7/8	
916	R	F	F	N						G	F	P	P	F														3/4	
924	R	F	P	Y	PA	S	G	BRA	G	G	F	F	O	F														13/16	Rope running high
932	R	F	F	Y	PA	S	G	BRA	G	P	F	F	P	G														9/16	Pulleys not in contact
940	R	F	P	N						G	F	F	P	F														1/2	
948	R	F	P	Y	PA	S	G	BAB	G	F	F	F	P	P														7/8	
956	R	F	F	N						G	F	F	P	F														13/16	
964	R	P	P	N						G	F	F	G	F														3/4	
972	R	F	F	N						G	F	F	G	F														7/8	
974	Wood Wood	F/F	G/G	Y	CR	CI	G	BRA	G	P	P	F	G	P														3/4	
989	R	F	F	Y	Urethene Alumin		G	AF	G	P	F	P	P	F														7/8	
994	R	F	F	N						F	P	P	P	F														5/8	

Street: HYDE From: UNION To: FILBERT Inbound: Outbound X

Date 8/ 7/ 78

Switch No.	Switch Covers: Material	Switch Covers: Condition	Guard Frame: Condition	Guard Frame: Present	Pulley Type: Pole Fetters	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Gate Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Beam Frame: Good Fair Poor	Dep. Beam Pulleys: Good Fair Poor	Dep. Beam Anchor Good Fair Poor	Safety Latch Good Fair Poor	Safety Latch Frame: Good Fair Poor	Safety Latch Tongue: Good Fair Poor	Gypsy Latch: Good Fair Poor	Gypsy Mechanism Good Fair Poor	Slot Width: (in fraction of in.)	Additional Remarks
100	W	G	G	N						G	P	P	P	P														15/16	Take out
102	W/W	P/P	F/F	Y	DB	2/S	G/G	2/AF		F	P	P	P	P							F	G	P					11/16	
110	R	P	P	N						G	P	P	P	F														11/16	
118	R	P	F	N						G	P	F	P	P														3/8	
126	R	F	F	Y	PA	S	P	BAB	G	G	P	F	P	P														11/16	Bad Bearings
134	R	F	F	N						G	P	P	P	P														3/4	
142	R	P	D	Y	PA	S	G	BAB	G	F	P	P	P	F														5/8	
150	R	P	F	N						G	P	P	P	F														7/8	
160	R	F	F	Y	PA	S	F	BAB	G	F	P	P	P	F														15/16	Bad Bearings
170	R	F	F	Y	PA	S	G	BAB	G	P	P	P	G	F														7/8	
180	Wood	G/G	F/F	Y	CR	CI	G	BAB	G	P	P	P	P	F														3/4	
190	Wood	F	F	N						G	P	P	P	P														7/8	
160	R	F	P	N						G	F	F	P	F														11/16	
102	W/W	P/P	P/P	Y	DB	2/S	G/G	2/AF		P	F	F	P	G							G	G	P					7/8	
108	R	F	P	N						F	F	F	F	P														5/8	
110	R	F	P	N						F	F	F	F	P														3/4	
124	R	F	P	Y	PA	S	P	BRS	G	P	F	F	G	P														3/4	
128	W	F	G	N						G	F	F		P														1 1/8	Take out
132	R	F	P	N						P	F	P	G	P														3/4	
136	R	F	P	Y	PA	S	G	BAB	G	P	F	F	G	F														13/16	Pulley off frame
140	R	F	F	Y	PA	S	P	BAB	F	P	F	F	P	F														1	against this pulley both stopped

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Street: HYDE From: FILBERT To: LOMBARD Inbound: Outbound X

Date 8/7/78

Hatch No. HY	Hatch Cover: Steel, Alum., Cl. Wood	Hatch Cover: Good Fair Poor	Hatch Frame: Good Fair Poor	Pulley Present: Yes No	Pulley Type: Pole Letters	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Mate Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Beam Frame: Good Fair Poor	Dep. Beam Pulleys: Good Fair Poor	Dep. Beam Anchor Good Fair Poor	Safety Latch Frame: Good Fair Poor	Safety Latch Tongue: Good Fair Poor	Turnable Latch: Good Fair Poor	Gypsy Mechanism Good Fair Poor	Slot Width: (in fraction of in.)	Additional Remarks
244	R			Y	PA	S	G	AF	G	G	F	F	P	F															7/8	
248	R	F	F	Y	PA	S	G	BAB	G	F	F	F	P	F															7/8	
256	R	F	P	Y	PA	S	G	BRS	G	G	F	F	P	G															15/16	
264	R	F	P	Y	PA	S	F	BRS	G	G	F	F	P	F															15/16	
272	R	F	F	Y	PA	S	G	BRS	G	G	F	F	P	F															3/4	Rope running High
180	R	F	F	Y	PA	S	G	BRS	G	G	P	P	P	P															7/8	Pulley not in contact
189	R	F	F	N						G	P	P	P	P															5/8	
196	R	F	P	N						G	P	P	P	F															5/8	
202	R	F	P	Y	Ureth Alumin		G	AF	G	F	P	P	P	F															3/4	
206	R	F	P	N						F	P	P	P	P															11/16	
210	R	F	P	Y	Ureth Alumin		G	AF	P	F	P	P	P	F															1/2	
219	R	F	P	Y	PA	S	G	BAB	G	P	F	F	P	P															1/2	
216	R	F	F	N						G	F	F	P	P															5/8	
223	R	F	F	Y	PA	S	G	BAB	G	G	F	F	P	P															3/4	
232	R	P	P	N						G	F	F	P	P															1/2	
240	R	F	P	Y	PA	S	G	BAB	G	G	F	F	P	P															5/8	
248	R	F	F	N						G	P	P	P	P															3/4	
258	R	F	F	Y	PA	S	F	BAB	G	G	P	P	P	F															3/4	
268	R	F	P	N						G	P	P	P	F															9/16	
278	R	F	P	Y	PA	S	G	BRS	G	G	P	P	P	G															11/16	Rope High
288	R	F	P	N						G	P	P	P	P															3/4	

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Street: HYDE From: LOMBARD To: CHESTNUT Inbound: Outbound X

Date 8 / 7 / 78

Match No.	BY	Match Covers: Brick, Pavers, Concrete	Match Covers: Wood, Pavers, Concrete	Match Covers: Good, Fair, Poor	Match Covers: Clean, Fair, Poor	Match Covers: Yes, No, Percent	Pulley Type: Cast, Plate, Letters	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-F., Brass, Babb.	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Outside Rail: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Mate Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Point: Good, Fair, Poor	Dep. Beam: Good, Fair, Poor	Dep. Beam Brace: Good, Fair, Poor	Dep. Beam Pulleys: Good, Fair, Poor	Dep. Beam Anchor: Good, Fair, Poor	Safety Latch: Good, Fair, Poor	Safety Latch Brace: Good, Fair, Poor	Turnbuckle Torque: Good, Fair, Poor	Gypsy Mechanism: Good, Fair, Poor	Slot Width: Good, Fair, Poor	Slot Width (in fraction of in.)	Additional Remarks
298		R	F	F	N						G	P	P	G	F																3/4	
300		R/R	F/F	P/P	Y	CR	CI	G	BAB	G	P	P	P	P	F																3/4	
306		R/R	F/F	P/P	Y	CR	CI	G	BAB	G	P	P	P	P	F																5/8	
312		R	F	P	N						F	P	P	F	F																3/4	
[illegible]		R	F	F	Y	PA	S	G	BAB	G	P	P	P	P	F																9/16	
328		R	F	F	Y	PA	S	G	BAB	G	G	P	P	P	G																1/2	
338		R	P	P	N						G	P	P	P	F																5/8	
344		R	F	P	N						G	P	P	P	G																5/8	
2334		R	F	P	N						G	P	P	F	G																1/2	
2364		R	F	P	Y	PA	S	P	BRS	G	P	P	P	G	F																5/8	
2374		R	F	P	N						P	P	P	F	F																3/4	
2389		R	F	P	N						F	P	P	F	F																1/2	
2392		W/W	P/P	P/P	Y	DB	2/S	G/G	2/ AF		F	P	P	P	F								F	G	P					5/8	
2394		R	P	P	N						F	P	P	P	F																11/16	
2400		R	F	F	N						G	P	P	P	F																1	
404		Wood Wood	F/F	F/F	Y	CR	CI	F	BAB	G	F	P	P	P	F																7/8	30" Cr.
2408		Wood Wood	F/F	P/P	Y	CR	CI	F	BAB	G	P	P	P	P	F																1	30" Cr.
2418		R	F	P	N						F	P	P	P	G																3/4	
2026		R	F	P	N						G	P	P	P	G																11/16	
2034		R	F	P	N						F	P	P	P	G																7/8	
438		W	G	G	N						G	P	P	P	P																1	Magnetic Preampt

Street: HYDE From: CHESTNUT To: BAY Inbound: _____ Outbound X

Date 9 / 7 / 78

Hatch No.	Hatch Cover: Metal, Cl. Wood	Hatch Cover: Good, Fair, Poor	Hatch Frame: Good, Fair, Poor	Pulley Present: Yes, No	Pulley Type:	Pulley Letters	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Outside Rail: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement Condition Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Mate Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Point: Good, Fair, Poor	Dep. Beam Frame: Good, Fair, Poor	Dep. Beam Frame: Good, Fair, Poor	Dep. Beam Pulleys: Good, Fair, Poor	Good Anchor	Safety Latch Frame: Good, Fair, Poor	Safety Latch Tongue: Good, Fair, Poor	Turnable Latch: Good, Fair, Poor	Gypsy Mechanism: Good, Fair, Poor	Slot Width: Good, Fair, Poor (in fraction of in.)	Additional Remarks
HY 442	R	F	P	Y	Ureth Alumin		G	AF	G	G	P	P	P	P															7/8	
450	R	F	P	N						G	P	P	P	F															7/8	
458	R	P	P	N						G	P	P	P	G															7/8	
460	W	G	G	N						G	P	P	P	P															1 1/8	Mag. Prempt
460*	R	F	F	N						G	P	P	P	G															1 1/8	
468	R	F	F	Y	PA	S	G	BAB	G	G	P	P	P	G															1	
476	W	F	F	Y	Ureth Alumn		G	AF	G	G	P	P	P	G															7/8	
484	R	F	P	N						G	P	P	P	F															7/8	
490	R	P	P	N						G	P	P	P	P															7/8	
502	R	P	F	N						G	P	P	P	P															1	
510	R	P	F	Y	Ureth Alumn		G	AF	G	G	P	P	P	G															7/8	
518	R	F	P	Y	PA	S	G	BAB	G	G	P	P	P	P															7/8	Rope high
526	R	F	F	Y	PA	S	G	BAB	G	G	P	P	P	P															7/8	" "
534	R	F	P	N						F	P	P	P	F															1	
542	R	F	P	N						F	P	P	P	G															7/8	
550	R	F	P	N						F	P	P	P	G															5/8	Rope alongside
558	R	P	P	N						F	P	P	P	G															7/8	
566	R	F	P	N						G	P	P	P	G															7/8	
574	R	F	P	N						G	P	P	P	G															7/8	
584	R/W	F/P	P/P	Y	DB	2/S	G/G	2/ AF		F	P	P	P	G							F	G	P						7/8	1st Twobeams
594	R/W	F/P	P/P	Y	DB	2/S	P/G	2/ AF		F	P	P	P	P							F	1P 1G	P						7/8	2nd Twobeams

Street: HYDE From: BAY To: BEACH Inbound: Outbound X

Date 8 / 7 / 78

Hatch No.	Hatch Cover: Wood / Steel / CI / Alum.	Hatch Cover: Good / Fair / Poor	Hatch Frame: Good / Fair / Poor	Pulley Present: Yes / No	Pulley Type: Side Rollers / Gunn.	Pulley Material: Cast Iron / Steel / Alum.	Pully Condition: Good / Fair / Poor	Pulley Bearings: Anti-Fr. / Brass / Babb.	Pulley Support: Good / Fair / Poor	Channel Condition: Good / Fair / Poor	Outside Rail: Good / Fair / Poor	Inside Rail: Good / Fair / Poor	Slot Rail: Good / Fair / Poor	Navigation Lights: Good / Fair / Poor	Switch Rails: Good / Fair / Poor	Switch Points: Good / Fair / Poor	Mate Rails: Good / Fair / Poor	Frog Rails: Good / Fair / Poor	Slot Guides: Good / Fair / Poor	Slot Point: Good / Fair / Poor	Dep. Beam Frame: Good / Fair / Poor	Dep. Beam Pulleys: Good / Fair / Poor	Dep. Beam Anchor Good / Fair / Poor	Safety Latch Frame: Good / Fair / Poor	Safety Latch Tongue: Good / Fair / Poor	Turntable Latch: Good / Fair / Poor	Gypsy Mechanism Good / Fair / Poor	Slot Width: (in fraction of in.)	Additional Remarks
HY																														
600	W	G	G	N						G	P	P	P	F														1	Signal return
604	Wood Wood	F/F	P/P	Y	CR	CI	F	BAB	G	P	P	P	P	F														13/16	
610	R	P	P	N						F	P	P	P	F														3/4	
613	R	P	P	N						G	P	P	P	F														5/8	
626	R	P	P	Y	URETH ALUMIN		G	AF	G	G	P	P	P	F														11/16	
634	R	F	P	N						G	P	P	P	F														3/4	
642	R	F	P	N						G	P	P	P	F														3/4	
650	R	F	F	Y	PA	S	P	BAB	P	P	P	P	P	F														7/8	
658	R	F	F	Y	PA	S	F	BAB	F	P	P	P	P	G														7/8	Dirt holding pulley
666	R	F	P	N						G	P	P	P	P														3/4	
674	R	P	P	N						G	P	P	P	P														7/8	
682	R/W	P/F	P/P	Y	DB	2/s	G/G	2/ AF		G	P	P	P	F							F	G	P					3/4	
690	R	P	P	N						F	P	P	P	F														1	
702	Wood Wood	F/F	F/F	Y	CR	CI	G	BAB	G	P	P	P	P	P														13/16	30" Cr.
710	R	F	P	N						G	P	P	P	F														7/8	
718	R	P	P	N						G	P	P	P	F														3/4	
726	R	F	P	N						G	P	P	P	F														3/4	
734	R	F	P	Y	PA	S	G	BAB	G	G	P	P	P	F														3/4	
742	R	F	P	N						G	P	P	F	G														7/8	
750	R	F	P	N						G	P	P	F	G														3/4	
758	R	F	P	N						G	P	P	F	F														3/4	

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Street: MYDE From: BEACH To: Inbound: Outbound X

Date 8/8/78

Hatch No.	Hatch Cover: Weld-Bevel, CI, Wood	Hatch Cover: Good Fair Poor	Hatch Frame: Good Fair Poor	Pulley Present: Yes No	Pulley Type: Roller, Sheave	Pulley Letters	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Mate Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Beam Frame: Good Fair Poor	Dep. Beam Pulleys: Good Fair Poor	Dep. Beam Anchor Good Fair Poor	Safety Latch Frame: Good Fair Poor	Safety Latch Tongue: Good Fair Poor	Turntable Latch: Good Fair Poor	Gypsy Mechanism Good Fair Poor	Slot Width: (in fraction of in.)	Additional Remarks
762	R	F	P	N						G	P	P	F	G															3/4	
768	W	F	G	N						F	P	P		P															7/8	Take
778	W/W	F/F	F/F	Y	2 DB	2/S	G/G	2/ AF		P	F	F		P								G	G	G					5/8	
780	W	G	G	N						P	F	F	G	G															7/8	
789	W	G	G	N						P	F	F	G	P															13/16	
788	W	G	G	N						P	F	F	G	P															3/4	Signl prempt
800	W	G	G	N						F	F	F	P	P															1	
806	W/W	G/G	G/G	Y	CR	CI	G	BRS	G	F	F	F	P	F															3/4	
808	W	G	G	N						P	F	F	P	F															11/4	Bumper bar
840	W	P	G	N						F	F	F	G	P															7/8	
848	W/W	G/G	G/G	Y	CR	CI	G	BRS	G	F	G	G	G	G															3/4	20" Cr.
850	W	G	G	N						P	G	G	G	F															3/4	Sig prempt
856	W	G	G	Y	PA	S	F	BAB	P	F	G	G	G	G															13/16	Rope High
										Turntable -- Beach and Hyde																				

Street: California From: Drumm To: Market Inbound: X Outbound

Date 3/15/78

Hatch No. CA	Hatch Cover: Worn Edges, Cracks	Hatch Cover: Good Fair Poor	Hatch Frame: Good Fair Poor	Pulley Present: Yes No	Pulley Type: Single Double	Pulley Material: Cast Iron Steel	Pulley Condition: Good Fair Poor	Pulley Bearings: Good Fair Poor	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Cutaway Condition: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongues: Good Fair Poor	Pole Paint: Good Fair Poor	Trolley Paint: Good Fair Poor	Sign Guides: Good Fair Poor	Sign Paint: Good Fair Poor	Dep. Base Paint: Good Fair Poor	Dep. Base Pulleys: Good Fair Poor	Dep. Base Kicker: Good Fair Poor	Safety Latch: Good Fair Poor	Safety Latch Type: Turnbuckle Latch	Gypsy Wrench: Good Fair Poor	Slot Width: (in fraction of inch)	Additional Remarks
27	R	P	P	Y	PA	S	F	Bab	G	F	P	P	F	F														5/8	Rope light - pulley slow
23	R	P	P	N						G	P	P	F	F														3/4	
17	R	P	P	N						G	P	P	F	P														5/8	
3	R	P	P	N						G	P	P	F	P														3/4	
1	R	P	P	Y	PA	S	G	Bab	G	F	P	P	F	F														7/8	
011	R	P	P	Y	PA	S	P	Bab	P	P	P	P	F	F														3/4	Pulley stopped - debris
09	R	P	P	N																								3/4	Bumper bar
03	W	G	G	N						G	G	G	G	G													G	3/4	Gypsy
02	W	G	G	N						G	G	G	G	G														3/4	Take out
01	W	G	G	Y	CR	CI	G	Bab	G	G	G	G	G	G														3/4	

Street: California From: Davis To: Drumm Inbound: X Outbound

Date 3/15/78

| Hatch No. CA | Hatch Cover: Yes/No | Hatch Cover: Fiber Glass/Steel | Hatch Cover: Good/Fair/Poor | Hatch Frame: Good/Fair/Poor | Pulley Present: Yes/No | Pulley Type: Single/Double | Pulley Material: Iron/Steel/Alum. | Pulley Condition: Good/Fair/Poor | Pulley Bearings: Anti-Fr./Brass/Babb. | Pulley Support: Good/Fair/Poor | Channel Condition: Good/Fair/Poor | Outside Rail: Good/Fair/Poor | Inside Rail: Good/Fair/Poor | Exit Rail: Good/Fair/Poor | Pavement Condition: Good/Fair/Poor | Switch Rails: Good/Fair/Poor | Switch Tongue: Good/Fair/Poor | Vale Rails: Good/Fair/Poor | Frog Rails: Good/Fair/Poor | Slot Guides: Good/Fair/Poor | Slot Points: Good/Fair/Poor | Rev. Trac: Good/Fair/Poor | Rev. Trac Pulleys: Good/Fair/Poor | Sweep Anchor Good/Fair/Poor | Sweep Latch Good/Fair/Poor | Sweep Latch Trac: Good/Fair/Poor | Sweep Latch Pulleys: Good/Fair/Poor | Sweep Latch Guides: Good/Fair/Poor | Sweep Latch Points: Good/Fair/Poor | Sweep Latch Rev. Trac: Good/Fair/Poor | Sweep Latch Rev. Trac Pulleys: Good/Fair/Poor | Sweep Latch Rev. Trac Points: Good/Fair/Poor | Sweep Latch Rev. Trac Guides: Good/Fair/Poor | Sweep Latch Rev. Trac Switch: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Points: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Guides: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Rails: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Tongue: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Vale Rails: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Frog Rails: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Slot Guides: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Slot Points: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Rev. Trac: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Rev. Trac Pulleys: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Rev. Trac Points: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Rev. Trac Guides: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Rev. Trac Switch: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Rev. 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Trac Points: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Guides: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Points: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Guides: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rails: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Tongue: Good/Fair/Poor | Sweep Latch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. Trac Switch Rev. 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Street: California From: Sausome To: Davis Inbound: X Outbound

Date 3/15/78

Hatch No. CA	Hatch Cover: Yes/No	Hatch Cover: Excess Cl. Wash	Hatch Cover: Good Fair Poor	Hatch Frame: Good Fair Poor	Pulley Present: Yes No	Pulley Type: Fixed Lowers	Pulley Material: Cast Iron, Steel, Bronze	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr. Brass, Ball	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Vale Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Brm Trace: Good Fair Poor	Dep. Brm Pulleys: Good Fair Poor	Dep. Brm Anchor Good Fair Poor	Safety Latch Trace: Good Fair Poor	Safety Latch Tongue: Good Fair Poor	Turnable Latch: Good Fair Poor	Gypsy Rectangle Slot: Good Fair Poor	Slot Width (in fraction of in.)	Additional Remarks
423	R	P	P	Y	PA	S	P	Bab	P	P	P	P	F	F																5/8	Pulley stopped - Brng BO
401	R	P	P	Y	PA	S	P	Bab	P	P	G	G	F	F																3/4	Pulley stopped
379	R	P	P	Y	PA	S	P	Bab	P	P	G	G	F	F																3/4	
367	R	P	P	N						G	P	P	P	P																3/4	
361	R	P	P	Y	PA	S	G	Bab	G	F	P	P	F	F																13/16	
355	R	P	P	N						G	P	P	F	P																3/4	
349	R	P	P	Y	PA	S	P	Bab	F	P	P	P	F	F																3/4	Pulley stopped - debris
341	R	P	P	N						G	P	P	P	F																11/16	
333	R	P	P	Y	PA	S	G	Bab	G	F	P	P	P	F																11/16	
325	R	P	P	N						G	P	P	F	P																5/8	
317	R	P	P	Y	PA	S	G	Bab	F	F	P	P	G	F																5/8	
315	R	P	P	N						G	P	P	G	F																3/4	
309	R	P	P	Y	PA	S	G	Bab	G	G	P	P	F	P																11/16	
301	R	P	P	N						G	P	P	F	F																3/4	
291	R	P	P	Y	PA	S	F	Bab	F	F	P	P	F	F																5/8	
269	R	P	P	Y	PA	S	P	Bab	F	P	P	P	P	F																3/4	Pulley stopped
255	R	P	P	N						G	P	P	P	F																3/4	
249	R	P	P	Y	PA	S	G	Bab	G	F	P	P	F	F																3/4	
241	R	P	P	Y	PA	S	P	Bab	P	P	P	P	F	P																5/8	
233	R	P	P	N						G	P	P	P	P																11/16	
225	R	P	P	N						G	P	P	P	P																5/8	

Street: California From: Kearney To: Sansome Inbound: X Outbound

Date 3/15/78

Hatch No. CA	Hatch Cover: Wood, Iron, Cl. Wood	Hatch Cover: Good, Fair, Poor	Hatch Frame: Good, Fair, Poor	Pulley Present: Yes, No	Pulley Type: Face, Cast Iron, Steel, Alum.	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Outside Rail: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Vale Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Points: Good, Fair, Poor	Dep. Brss Trans: Good, Fair, Poor	Dep. Brss Pulleys: Good, Fair, Poor	Dep. Brss Anchor: Good, Fair, Poor	Safety Latch Poor: Good, Fair, Poor	Safety Latch Trans: Good, Fair, Poor	Safety Latch Tongue: Good, Fair, Poor	Turnable Latch: Good, Fair, Poor	Gypsy, Rectangle: Good, Fair, Poor	Slot Width: (in fraction of in.)	Additional Remarks
583	R	P	P	N						F	P	P	G	F																1/4	
577	R	P	P	N						F	P	P	G	F																11/16	
555	R	P	P	Y	PA	S	G	Bra	G	G	P	P	G	P																3/4	
559	R	P	P	N						G	P	P	G	P																3/4	
553	R	P	P	Y	PA	S	P	Bra	P	P	P	P	F	F																7/8	
545	R	P	P	Y	R	CI	G	Bra	G	F	P	P	F	F																13/16	
539	R	P	P	Y	PA	S	G	Bab	G	F	P	P	F	P																3/4	Rope High
535	R	P	P	N						G	P	P	G	F																3/4	
523	R	P	P	Y	PA	S	G	Bab	G	F	P	P	G	F																3/4	Rope High - Pulley still
515	R	P	P	N						G	P	P	G	P																13/16	
499	R	P	P	Y	PA	S	G	Bab	G	F	P	P	G	P																7/8	Rope High - Pulley still
485	R	P	P	Y	PA	S	G	Bab	G	F	P	P	F	P																7/8	
477	R	P	P	Y	PA	S	F	Bab	G	F	P	P	F	P																7/8	Rope High - Pulley still
475	R	P	P	N						G	P	P	F	P																3/4	
469	R	P	P	Y	PA	S	G	Bab	G	G	P	P	G	F																11/16	
463	R	P	P	Y	PA	S	G	Bab	G	G	P	P	G	F																3/4	
459	R	P	P	N						G	P	P	G	P																5/8	
455	R	P	P	Y	PA	S	G	Bab	G	F	P	P	F	F																5/8	
447	R	P	P	N						G	P	P	F	P																11/16	
439	R	P	P	Y	PA	S	G	Bab	F	F	P	P	G	F																5/8	
431	R	P	P	N						G	P	P	G	F																5/8	

Street: California From: Grant To: Kearney Inbound: X Outbound:

Date 8 / 15/ 78

Match No. CA	Match Cover: Iron Fair Poor	Match Cover: Cast Fair Poor	Match Frame: Cast Fair Poor	Pulley Present: Yes No	Pulley Type: Cast Integral	Pulley Material: Iron Steel Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr. Brass Babb.	Pulley Support: Cast Fair Poor	Channel Condition: Cast Fair Poor	Curbside Rail: Cast Fair Poor	Inside Rail: Cast Fair Poor	Slot Rail: Cast Fair Poor	Pavement Condition: Good Fair Poor	Switch Rails: Cast Fair Poor	Switch Tongue: Cast Fair Poor	Vale Rails: Cast Fair Poor	Frog Rails: Cast Fair Poor	Slot Guides: Cast Fair Poor	Slot Points: Cast Fair Poor	Dep. Trace: Cast Fair Poor	Dep. Bead Pulleys: Cast Fair Poor	Dep. Bead Anchor Cast Fair Poor	Safety Latch Frame: Cast Fair Poor	Safety Latch Tongue: Cast Fair Poor	Turnabout Latch: Cast Fair Poor	Gipsy Mechanism: Cast Fair Poor	Slot Width: Fair Poor (in fraction of in.)	Additional Remarks
665	R	P	P	Y	Urethane Alum		G	AF	G	F	P	P	G	F															7/8	
659	W	G	G	N						G	P	P	G	G															7/8	
655	R	P	P	N						G	P	P	G	F															5/8	
649	R	½	½	N						G	P	P	G	G															5/8	
643	R	P	P	Y	Urethane Alum		G	AF	G	F	P	P	G	G															7/8	
641	R	P	P	N						G	P	P	P	P															3/4	
639	R	P	P	N						G	P	P	P	R															7/8	
637	W	P	P	N						G	P	P		F															3/4	Take out
635	W	P	P	N						G	P	P	P	P															3/4	Pre-empt
633	R	P	P	Y	PA	S	P	Bra	G	P	P	P	G	F															3/4	Pulley down
629	R	P	P	N						G	P	P	G	G															3/4	
625	R	P	P	N						G	P	P	G	G															7/8	
619	R	P	P	N						G	P	P	G	G															13/16	
611	R	P	P	N						G	P	P	G	G															7/8	
605	R	P	P	N						G	P	P	G	G															7/8	
601	W/W	G/G	G/G	Y	DB	2/S	G/G	2/AB		G	P	P	G	G						G	G	G							13/16	
597	R	P	P	Y	PA	S	G	Bab	G	G	P	P	G	G															13/16	
591	R	P	P	Y	PA	S	G	Bab	G	G	P	P	G	G																

Street: California From: Stockton To: Grant Inbound: X Outbound

Date 8/15/78

Hatch No. CA	Hatch Cover: Wood / Steel / Cl. Iron	Patch Cover: Good Fair Poor	Patch Trans: Good Fair Poor	Pulley Yes No	Pulley Present: Yes No	Pulley Type: Solid / Arms	Pulley Material: Cast Iron / Steel / Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fric. / Babbit	Pulley Bearings: Good Fair Poor	Channel Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Gate Rails: Good Fair Poor	Prop Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Points: Good Fair Poor	Dep. Gear Trans: Good Fair Poor	Dep. Beam Trans: Good Fair Poor	Dep. Beam Pulleys: Good Fair Poor	Safety Anchor Good Fair Poor	Safety Latch Trans: Good Fair Poor	Safety Latch Tongue: Good Fair Poor	Turntable Latch: Good Fair Poor	Gypsy Mechanism: Good Fair Poor	Slot Width: (In fraction or in.)	Additional Remarks
783	W	P	P	N						G	P	P	G	G																1/2	
779	W	P	P	Y	PA	S	P	Bra	G	F	P	P	G	G																5/8	Pulley stuck
777	W	G	G	N						G	P	P	G	F																11/16	Prescmpt
775	R	P	P	N						G	P	P	G	G																5/8	
755	R	P	P	N						G	P	P	G	G																11/16	Rope drags bottom of channel
747	R	P	P	N						G	P	P	F	F																13/16	Rope drags bottom of channel
741	R	P	P	N						G	P	P	P	G																3/4	
735	R	P	P	Y	PA	S	F	Bra	G	F	P	P	P	F																7/8	
729	R	P	P	Y	PA	S	F	Bra	G	P	P	P	P	F																3/4	Bearings dry
727	W	G	G	N						P	P	P	P	F																11/16	
725	W	G	G	N						G	P	P	P	F																7/8	
717	R	P	P	Y	Urethand Alum		G	AF	G	P	P	P	P	F																3/4	
711	R	P	P	N						F	P	P	F	P																7/8	
705	W	G	G	N						G	F	F	P	F																5/8	
703	W/W	G/G	G/G	Y	DB	2/S	G/G	2/AF		F	F	F	P	P									G	G	G					7/8	
693	wood/ wood	F/F	F/F	Y	CR	CI	G	Bab	G	F	G	P	P	P																13/16	42"
687	wood/ wood	G/G	F/F	Y	CR	CI	G	Bab	G	F	P	G	P	G																5/8	42"
685	W	G	G	N						P	P	G	G	P																3/4	Signal return
	W	G	G	N						P	P	P	G	F																3/4	No number
677	CI	G	P	N						G	P	P	G	G																11/16	
671	G	G	P	N						G	P	P	G	G																3/4	

Street: California From: Powell To: Stockton Inbound: X Outbound

Date 8/15/78

Hatch No. CA	Hatch Cover: Wood, Brass, CI, Steel	Patch Cover: Good, Fair, Poor	Patch Trace: Good, Fair, Poor	Pulley Present: Yes, No	Pulley Type: Rod, Pulley	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-Fr., Brass, Babbit	Pulley Support: Good, Breeze, Babbit	Channel Condition: Good, Fair, Poor	Outside Rail: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Rate Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Point: Good, Fair, Poor	Dep. Brace: Good, Fair, Poor	Dep. Brace Pulleys: Good, Fair, Poor	Dep. Brace Anchor: Good, Fair, Poor	Safety Latch: Good, Fair, Poor	Safety Latch Trace: Good, Fair, Poor	Turnbuckle Latch: Good, Fair, Poor	Gypsy Wormscrew: Good, Fair, Poor	Slot Width (in fraction of in.)	Additional Remarks
897	R	F	F	N						G	G	P	G	P														7/8	
889	Wood	F/F	F/F	Y	CR	CI	G	Bab	G	F	P	P	G	P														5/8	39" CR
885	Wood	G/G	F/F	Y	CR	CI	F	Bab	G	F	P	P	P	P														1/2	30" CR
879	R	P	P	Y	R	CI	P	Bra	F	F	P	P	G	G														5/8	Pulley stopped
873	R	P	P	Y	PA	S	G	Bra	F	F	P	P	G	G														1/2	
865	R	P	P	Y	PA	S	P	Bra	P	P	P	P	G	G														5/8	
861	R	P	P	Y	PA	S	P	Bra	F	P	P	P	G	G														5/8	
855	R	P	P	N						F	P	P	G	G														3/4	
849	R	P	P	N						G	P	P	G	G														3/4	
845	R	P	P	Y	PA	S	F	Bra	G	F	P	P	G	G														5/8	
839	R	P	P	N						G	P	P	G	G														3/4	
833	R	P	P	Y	R	CI	P	Bra	G	F	P	P	G	G														5/8	
827	R	P	P	N						G	P	P	G	G														9/16	
821	R	P	P	N						G	P	P	G	G														5/8	
815	R	P	P	N						P	P	P	G	F														11/16	
809	R	P	P	N						F	P	P	G	G														11/16	
807	W/W	P/P	F/F	Y	DB	2/S	P/P	2/AF		F	P	P		G							G	P	G					1	1 pulley stopped
801	W/W	G/G	G/G	Y	DB	2/S	F/F	2/AF		F	P	P		G							G	F	G					1-1/8	Pulley worn
799	W/W	G/G	G/G	Y	CR	CI	G	Bab	G	P	G	G	G	G														3/4	36"
795	W/W	G/G	G/G	Y	CR	CI	G	Bab	G	P	G	G	G	G														1/4	26"
787	W	G	G	Y	PA	S	F	Bra	G	P	P	P	G	F														1/2	

Street: California From: Mason To: Powell Inbound: X Outbound

Date 9/12/78

Catch No.	Catch Cover: Material	Cover: Condition	Cover: Friction	Pulley Present:	Pulley Type:	Pulley Material:	Pulley Condition:	Pulley Bearings:	Pulley Support:	Channel Condition:	Outside Rail: Condition	Inside Rail: Condition	Slot Rail: Condition	Pavement: Condition	Switch Rails: Condition	Switch Tongue: Condition	Mate Rails: Condition	Frog Rails: Condition	Slot Guides: Condition	Slot Point: Condition	Dep. Beam Frame: Condition	Dep. Beam Pulleys: Condition	Dep. Beam Anchor Condition	Safety Latch Frame: Condition	Safety Latch Tongue: Condition	Turnable Latch: Condition	Gypsy Mechanism: Condition	Slot Width: (in fraction of in.)	Additional Remarks
21	R	P	P	Y	PA	S	F	Bra	G	P	P	P	G	G														11/16	Extra pulley on bottom
25	R	P	P	N						G	P	P	G	P														3/4	
29	CI	P	P	N						P	P	P	G	P														3/4	
33	CI	P	P	Y	PA	S	F	Bra	G	F	P	P	G	P														3/4	Brng dry
35	CI	P	P	Y	PA	S	G	Bra	G	P	P	P	G	F														3/4	
37	wood/ wood	P/P	G/G	Y	CR	CI	G	Bab	G	F	P	P	P	G														13/16	42" CR/B.O. cover
31	R	P	P	N						G	P	P	G	G														9/16	
27	R	P	P	N						P	P	P	G	P														1/2	
21	W	F	F	Y	R	CI	G	Bra	G	F	P	P	G	P														3/4	
15	R	P	P	N						G	P	P	G	P														3/4	
55	R	P	P	N						G	P	P	G	F														11/16	
49	R	P	P	N						P	P	P	G	P														5/8	Support down - Rope cutting
45	W	F	F	N						G	P	P	P	P														3/4	
39	R	P	P	Y	PA	S	P	Bra	P	P	P	P	G	P														1/2	extra pulley on bottom
33	R	P	P	N						G	P	P	P	P														11/16	slot burned
27	W	P	P	Y	PA	S	G	Bab	G	G	P	P	P	P														3/4	Slot burned
21	R	P	P	N						G	P	P	P	P														9/16	
15	W	G	G	N						G	P	P		F														3/4	Take Out
13	R	P	P	N						G	P	P	P	P														7/8	Slot Burned
07	R	P	P	N						G	P	P	G	P														3/4	
05	W/W	F/F	F/F	Y	DB	2/S	F/F	2/AF		P	P	P		P						G	F	G						1	

Street: California From: Taylor To: Mason Inbound: X Outbound

Date 9/12/78

Hatch No. CA	Hatch Cover: Weld Prints Cl Fair Good	Hatch Cover: Patch Good Fair Poor	Hatch Frame: Good Fair Poor	Pulley Present: Yes No	Pulley Type: Fixed Fairlead	Pulley Material: Cast Iron Steel Alum	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr Brass Babb	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Pole Rails: Good Fair Poor	Trol. Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Joint: Good Fair Poor	Dep. Trac: Good Fair Poor	Dep. Trac Pulleys: Good Fair Poor	Dep. Trac Anchor: Good Fair Poor	Safety Latch Trac: Good Fair Poor	Safety Latch Track: Good Fair Poor	Turnable Latch: Good Fair Poor	Grip Mechanism: Good Fair Poor	Grip Width: (in fraction of inch)	Additional Remarks
1151	W	F	F	Y	Ureth Alum		P	AF	G	F	P	P	G	P															1/4	rope worn thru urethane
1143	W	F	F	Y	PA	S	P	Bra	G	F	P	P	G	F															3/4	
1135	R	P	P	Y	Ureth Alum		F	AF	G	G	P	P	G	P															1/4	noisy
1127	R	P	P	N						G	P	P	G	P															5/8	
1121	W	F	F	N						G	P	P	G	P															3/4	
1115	W	F	F	N						G	P	P		P															1/4	take out
1113	R	P	P	N						G	P	P	G	F															1/4	
1107	R	P	P	N						P	P	P	G	P															1/4	
1101	W/W	F/F	F/F	N						P	P	P		P															1/4	No DB - Rope slapping slot
1099	R	P	P	Y	PA	S	G	Bra	G	P	P	P	G	P															11/16	Rope 6" high - pulley covered
1095	CI	P	P	Y	PA	S	F	Bra	G	F	P	P	G	P															11/16	Brng dry
1089	R	P	P	N						G	P	P	G	P															9/16	
1079	R	P	P	N						G	P	P	G	P															9/16	
1075	R	P	P	Y	R	CI	P	Bra	G	P	P	P	G	P															5/8	Pulley out of support.
1069	R	P	P	N						F	P	P	G	P															3/4	
1061	R	P	P	Y	R	CI	P	Bra	G	P	P	P	G	F															5/8	Pulley stopped
1053	CI	F	P	N						F	P	P	G	P															11/16	
1047	W	F	F	N						G	P	P	G	P															5/8	Rope on bottom of channel
1041	CI	P	P	N						G	P	P	G	P															5/8	Rope on bottom of channel
1031	W	F	F	N						G	P	P	G	P															3/4	Rope on bottom of channel
1027	W	F	F	N						G	P	P	G	P															11/16	

Street: California From: Leavenworth To: Taylor Inbound: X Outbound

Date 9/1/78

Hatch No. CA	Hatch Cover: Wood, Steel, CI, Weld	Hatch Cover: Good, Fair, Poor	Hatch Frame: Good, Fair, Poor	Pulley Present: Yes, No	Pulley Type: Bare, Groove	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Outside Rail: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Gate Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Points: Good, Fair, Poor	Dep. Brace Frame: Good, Fair, Poor	Dep. Brace Pulleys: Good, Fair, Poor	Dep. Brace Anchor: Good, Fair, Poor	Safety Latch Frame: Good, Fair, Poor	Screw Latch Stroke: Good, Fair, Poor	Turnbuckle Latch: Good, Fair, Poor	Gypsy Mechanism: Good, Fair, Poor	Slot Width: (in fraction of in.)	Additional Remarks
1273	R	P	P	N						G	P	P	G	P															9/16	
1269	W	G	G	N						G	P	P	G	P															11/16	Pre-empt
1267	R	P	P	N						G	P	P	G	P															5/8	
1259	R	P	P	Y	R	CI	G	Bra	G	G	P	P	G	P															11/16	
1251	R	P	P	Y	R	CI	G	Bra	G	G	P	P	G	P															3/4	
1243	R	P	P	Y	R	CI	P	Bra	G	G	P	P	G	P															3/4	Pulley stopped
1233	R	P	P	Y	R	CI	F	Bra	G	G	P	P	G	F															11/16	
1229	R	P	P	Y	PA	S	F	Bra	G	G	P	P	G	G															11/16	
1221	R	P	P	Y	Urath Alum		G	AF	G	F	P	P	G	G															11/16	
1217	R	P	P	N						G	P	P	G	P															5/8	Broken plot joint
1211	R	P	P	Y	R	CI	P	Bra	G	P	P	P	G	F															3/4	
1201	WOOD / WOOD	F/F	G/G	Y	CR	CI	F	Bab	G	P	P	P	G	G															5/8	30" CR
1201	WOOD / WOOD	F/F	G/G	Y	CR	CI	F	Bab	G	F	P	P	G	G															5/8	30" CR
1199	W	F	F	Y	PA	S	P	Bab	P	P	P	P	G	P															5/8	Pulley down - rope cutting.
1195	WOOD / WOOD	F/F	G/G	Y	CR	CI	F	Bab	G	F	P	P	G	G															5/8	30" CR
1189	W	F	F	N						G	P	P	G	F															5/8	
1183	CI	P	P	Y	PA	S	P	Bra	P	P	P	P	G	G															11/16	Pulley down - rope cutting.
1177	R	P	P	Y	R	CI	P	Bra	G	P	P	P	G	P															3/4	Pulley flat spot - noisy
1167	W	F	F	N						G	P	P	G	P															3/4	
1163	W	F	F	Y	PA	S	P	Bra	G	F	P	P	G	P															5/8	Flat spot on pulley
1155	R	P	P	N						G	P	P	G	G															7/8	

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Street: California From: Hyde To: Leavenworth Inbound: X Outbound

Date 9/1/78

Catch No.	Hatch Cover: Solid, Hinged, CI Lined	Hatch Cover: Good Fair Poor	Hatch Frame: Good Fair Poor	Pulley Present: Yes No	Pulley Type:	Code Letters	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Mate Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Beam Frame: Good Fair Poor	Dep. Beam Pulleys: Good Fair Poor	Dep. Beam Anchor Good Fair Poor	Safety Latch Frame: Good Fair Poor	Safety Latch Tongue: Good Fair Poor	Turntable Latch: Good Fair Poor	Gypsy Mechanism Good Fair Poor	Slot Width: (in fraction of in.)	Additional Remarks
393	W/W	G/G	G/G	Y	DB	2/S	G/G	2/AF		P	F	F		P							G	G	G						7/8	
389	R	P	P	N						P	P	P	G	G															5/8	
383	W	G	G	N						P	P	P	G	P															5/8	
377	R	P	P	Y	PA	S	G	Bra	G	P	P	P	G	G															1/2	
373	W	G	G	N						P	P	P	G	F															3/4	
369	R	P	P	N						F	P	P	G	F															11/16	
363	R	P	P	Y	PA	S	G	Bab	F	P	F	F	G	F															5/8	
357	W	G	G	N						F	F	F		F	F	G	F	F	F	G									5/8	
351	W	G	G	Y	R	CI	G	Bra	G	P	G	P	G	F															3/4	
345	W	G	G	Y	R	CI	G	Bra	G	P	P	P	P	P															5/8	Broken slot rail
339	R	P	P	N						F	P	P	G	P															5/8	
333	R	P	P	Y	PA	S	G	Bab	G	G	P	P	G	G															5/8	
327	R	P	P	N						G	F	P	G	P															3/4	
321	R	P	P	Y	R	CI	P	Bra	P	P	P	P	G	P															5/8	Pulley out of frame rope cutting.
315	R	P	P	N						F	P	P	G	G															5/8	
309	R	P	P	N						F	P	P	G	P															1/2	
309	Wood Wood	G/G	G/G	Y	CR	CI	F	Bab	G	F	P	P	G	G															5/8	30"
301	R	P	P	N						F	P	P	G	P															7/8	
297	W/W	G/G	G/G	Y	DB	2/S	P/P	2/AF		P	P	P		P									G	P	G					7/8	1 Bad pulley
287	R	P	P	N						F	P	P	G	F															3/4	
279	R	P	P	Y	PA	S	P	Bra	G	F	P	P	G	G															11/16	

Street: California From: Larkin To: Hyde Inbound: X Outbound

Date 9 / 1 / 78

Catch No.	Catch Cover: Middle	Catch Cover: Gen'l	Catch Cover: Door	Pulley: Yes	Pulley Type:	Pulley Material:	Pulley Condition:	Pulley Bearings:	Pulley Support:	Channel Condition:	Outside Rail:	Inside Rail:	Slot Rail:	Pavement Condition	Switch Rails:	Switch Tongue:	Mate Rails:	Frog Rails:	Slot Guides:	Slot Point:	Dep. Beam Frame:	Dep. Beam Pulleys:	Dep. Beam Anchor	Safety Latch Frame:	Safety Latch Tongue:	Turnstile Tail	Gypsy Mechanism	Slot Width: (in fraction of in.)	Additional Remarks
531	R	P	P	N						G	P	P	G	F														3/4	
523	W	G	G	N						G	P	P	G	F														1/2	
515	R	P	P	Y	PA	S	G	Bra	G	F	P	P	G	G														11/16	
511	R			N						G	P	P	G	F														5/8	
501	Wood	Wood	G	Y	CR	CI	G	Bab	G	F	P	P	G	P														11/16	
499	W/W	G/G	G/G	Y	DB	2/S	P/P	2/AF		P	P	P		P					G	P	G							1	
495	R	P	P	N						G	P	P	G	P														5/8	
485	R	P	P	N						G	P	P	G	P														5/8	
477	R	P	P	N						P	P	P	G	P														11/16	
469	W	G	P	Y	Ureth Alum	P	AF	G		F	P	P	G	P														5/8	
459	R	P	P	N						G	P	P	G	P														11/16	
457	W	G	G	N						G	P	P	G	P														15/16	
451	R	P	P	N						G	P	P	G	P														3/4	
445	R	P	P	N						G	P	F	G	P														11/16	
437	R	P	P	N						G	P	F	P	P														7/16	Slot Rail Broken*
431	R	P	P	Y	PA	S	P	Bra	G	G	P	F	G	P														11/16	Pulley Stopped
421	R	P	P	N						G	P	P	G	P														3/4	
415	R	P	P	Y	PA	S	P	Bra	G	G	F	F	G	P														9/16	
407	W	G	G	N						G	F	F	G	P														7/8	
403	W/W	G/G	G/G	Y	CR	CI	F	Bab	G	F	F	F	G	G														13/16	
399	W	G	G	N						G	F	F	G	G														13/16	

Street: California From: Van Ness To: Larkin Inbound: X Outbound

Date 9/ 1/ 78

Hatch No.	Hatch Cover: Material	Hatch Cover: Cleats	Hatch Cover: Condition	Hatch Frame: Cond.	Pulley Present:	Pulley Type:	Pulley Material:	Pulley Condition:	Pulley Bearings:	Anti-Fr. Brass/ Babb.	Pulley Support:	Channel Condition:	Outside Rail:	Inside Rail:	Strt Rail:	Pavement Condition	Switch Rails:	Switch Tongue:	Vane Rails:	Frog Rails:	Slot Guides:	Slot Point:	Dep. Beam Frame:	Dep. Beam Pulleys:	Safety Anchor	Safety Latch Frame:	Safety Latch Tongue:	Turnable Latch:	Gypsy Mechanism	Slot Width: (in fraction of in.)	Additional Remarks
684	W	G	G	N						P	F	F		G															5/8	Take out (New)
673	W	G	G	N						G	F	F		P															5/8	" " (Old)
657	W	G	G	N						P	F	F	G	P														P	7/8	Not used
651	W/W	G/G	G/G	Y	R	CI	G	Bra	G	F	P	P	G	G															3/4	
645	W	G	G	N						G	P	P	G	F															3/4	
639	W	G	G	N						G	P	P	G	F															3/4	
631	R	P	P	N						G	P	P	G	F															3/4	
621	W	G	G	Y	Ureth Alum.		P	AF	G	P	P	P	G	G															3/4	Rope off center
615	R	P	P	Y	PA	S	F	Bra	G	P	P	P	G	G															3/4	
609	R	P	P	N						G	P	P	G	G															3/4	
601	W/W	G/G	G/G	Y	DB	2/S	G/G	2/AF		P	F	F		P							G	G	G						3/4	
599	W	G	G	N						F	F	F	G	G															3/4	
593	W/W	G/G	G/G	Y	DB	2/S	G/G	2/AF		P	F	F		P							G	G	G						3/4	
585	R	P	P	N						G	P	P	G	F															11/16	
583	R	P	P	N						G	P	P	G	G															11/16	
577	W	G	G	Y	PA	S	G	Bab	P	P	P	P	G	P															5/8	Tar build up Gl #1
569	R	P	P	N						G	P	P	G	F															11/16	
561	R	P	P	Y	Ureth Alum		G	AF	G	F	P	P	G	P															5/8	
555	W	G	G	N						P	P	P	G	P															5/8	
547	W	G	G	Y	PA	S	G	Bra	G	F	P	P	G	P															9/16	
539	W	G	G	Y	PA	S	F	Bra	G	F	P	P	G	P															5/8	

Street: California From: Larkin To: Van Ness Inbound: ____ Outbound X

Date 9/1/78

Hatch No. CA	Hatch Cover: Vent. Type	Hatch Cover: Cond.	Hatch Frame: Cond.	Pulley Present:	Pulley Type:	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Brg.-Pr., Brass, Babb.	Pulley Support: Cond.	Channel Condition: Good, Fair, Poor	Outside Rail: Cond.	Inside Rail: Cond.	Slot Rail: Cond.	Pavement Condition: Good, Fair, Poor	Switch Rails: Cond.	Switch Tongue: Cond.	Gate Rails: Cond.	Frog Rails: Cond.	Slot Guides: Cond.	Slot Point: Cond.	Dep. Beam Frame: Cond.	Dep. Beam Pulleys: Cond.	Dep. Brass Anchor: Cond.	Safety Latch Frame: Cond.	Safety Latch Tongue: Cond.	Turnbuckle: Cond.	Copper Weldment: Cond.	Slot Width (in fraction of in.)	Additional Remarks
1538	R	P	P	Y	R	CI	P	Bra	G	F	P	P	G	G														3/4	Pulley stopped
1546	R	P	P	Y	PA	S	P	Bra	G	F	P	P	G	F														11/16	Pulley stopped
1554	R	P	P	N						G	P	P	G	F														3/4	
1560	R	P	P	Y	Urethane Alum.		G	AF	G	F	P	P	G	G														11/16	
1568	R	P	P	N						G	P	P	G	G														5/8	
1576	R	P	P	Y	R	CI	G	Bra	G	F	P	P	G	P														9/16	
1582	R	P	P	N						G	P	P	G	P														5/8	
1586	R	P	P	N						G	P	P	G	P														11/16	
1592	W/W	G/G	F/P	Y	DB	2/S	P/P	2/ AF		F	F	F		P					G	P	G							7/8	
1598	W	G	G	N						G	F	F	G	P														7/8	
1600	W/W	G/G	G/G	Y	DB	2/S	G/G	2/ AF		F	F	F		G					G	G	G							7/8	
1608	W	G	G	N						G	P	P	G	P														11/16	
1614	W	P	G	Y	R	CI	G	Bra	G	P	P	P	G	P														11/16	
1622	R	P	P	N						G	P	P	G	P														3/4	
1630	R	P	P	Y	PA	S	G	Bra	G	F	P	P	G	P														3/4	
1640	R	P	P	N						G	P	P	G	P														5/8	
1646	R	P	P	Y	PA	S	G	Bra	G	F	P	P	G	F														3/4	
1652	R	P	P	Y	PA	S	G	Bra	G	F	P	P	G	F														5/8	
1658	R	P	P	N						G	P	P	G	F														5/8	
1666	W	G	G	Y	PA	S	G	Bab	G	P	F	F		F	F	P	F	F	G	G									
1670 76	R	P	P	N						F	P	P	G	F														5/8	2 Hatches

Street: California From: Hyde To: Larking Inbound: Outbound X

Date 8/ 29/ 78

Hatch No. CA	Hatch Cover: Weld Eyes, Cl. Weld	Hatch Cover: Weld Eyes, Cl. Weld	Hatch Cover: Cl. Weld	Hatch Frame: Fair Poor	Pulley Present: Yes No	Pulley Type: Sheave Cl. Weld	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr. Brass Babb.	Pulley Support: Cl. Weld Fair Poor	Chevrons: Good Condition: Fair Poor	Gutters: Good Condition: Fair Poor	Angle Pail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement: Good Condition Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Gate Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Lead Fair Poor	Dep. Lead Frame: Good Fair Poor	Dep. Lead Pulleys: Good Fair Poor	Safety Anchor: Good Fair Poor	Safety Latch Frame: Good Fair Poor	Safety Latch Tongue: Good Fair Poor	Gripper: Good Fair Poor	Slot Width: (in fraction of in.)	Additional Remarks
1400	W	G	G	Y	Hor	CI	G	Bra	G	F	F	F	G	G															7/8	
1402	W	G	G	N						P	F	F	P	G	G		G	G		G										
1406	W/W	G/G	G/G	Y	CR	CI	G	Bra	G	P	F	F	G	G															13/16	
1410	W	G	G	Y	6"	S	G	Bab	G	P	F	F	G	G															7/8	Gypsies not operation
1414	R	P	P	Y	PA	S	F	Bab	G	F	P	P	G	G															5/8	
1422	R	P	P	N						G	P	P	G	G															5/8	
1430	R	P	P	N						G	P	P	G	G															11/16	
1438	R	P	P	N						G	P	P	G	G															3/4	
1446	R	P	P	N						P	P	P	G	G															3/4	
1454	R	P	P	Y	R	CI	F	Bra	G	F	G	G	G	G															11/16	
1460	R	P	P	N						F	P	P	G	F															11/16	
1466	R	P	P	Y	PA	S	P	Bra	G	G	P	P	G	G															13/16	
1474	R	P	P	N						G	P	P	G	G															3/4	
1480	R	P	P	Y	PA	S	P	Bra	G	P	P	P	G	G															3/4	Pulley stopped
1490	R	P	P	N						P	P	P	G	G															3/4	
1498	W/W	G/G	G/G	Y	DB	2/S	P/I	2/ AF		P	P	P		G								G	P	P					1	1 pulley stopped
1500	wood/ wood	F/F	G/G	Y	CR	CI	F	Bab	G	F	P	P	G	G				9-1-78											5/8	30" CR
1510	R	P	P	N						G	P	P	G	G															11/16	
1514	R	P	P	Y	Urethan: Alum.		P	AF	P	P	P	P	G	F															5/8	Rope cutting pulle Pulley out of fram
1522	R	P	P	N						G	P	P	G	G															1/8	
1530	R	P	P	N						G	P	P	G	P															5/8	

Street: California From: Leavenworth To: Hyde Inbound: Outbound X

Date 8 / 28 / 78

Hatch No. CA	Hatch Cover: Vert. Fiber, Cl. Wood	Hatch Cover: Good Fair Poor	Hatch Frame: Good Fair Poor	Pulley Present: Yes No	Pulley Type: Cast Steel Cast Iron	Pulley Material: Steel Bronze	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr. Bronze Babb.	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Vale Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Head: Good Fair Poor	Dep. Head Pulleys: Good Fair Poor	Dep. Head Anchor: Good Fair Poor	Safety Latch Free: Good Fair Poor	Safety Latch Torque: Good Fair Poor	Peripheral Latch: Good Fair Poor	Gypsy Pockets: Good Fair Poor	Slot Width: (in fraction of in.)	Additional Remarks
1360	R	P	P	Y	N	CI	P	Brs	P	P	P	P	P	F															13/16	
1366	W 4/	F 4/	F 4/	N						F	P	P	P	P															1/4	Number Bar Post
1372	W	F	F	N						P	P	P		P	G		G	G		G										
1376	R	P	P	Y	PA	S	G	Bab	G	P	F	F	P	P															3/4	
1382	R	P	P	Y	BE	S	P	Bab	G	P	P	P	P	P															7/8	Stop
1384	W	F	F	Y	GYP	S	P	Brs	G	G	P	P	G	P														G	7/8	
1388	W	F	F	N						G	F	F	G	F															7/8	
CA-HY 3	W	F	F	N						P	G	G		F	G	F	G	F	F	G										

Street: California From: Jones To: Leavenworth Inbound: _____ Outbound: X

Date 8/28/18

Hatch No. CA	Hatch Cover: Wood, Fair, Poor; Metal, Good, Fair, Poor	Hatch Cover: Wood, Fair, Poor; Metal, Good, Fair, Poor	Hatch Frame: Good, Fair, Poor	Pulley Present: Yes, No	Pulley Type: Face, Keyway	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-Friction, Babbitt	Pulley Support: Steel, Brass/Bronze, Babbitt	Channel Condition: Good, Fair, Poor	Outside Rail Condition: Good, Fair, Poor	Inside Rail: Good, Fair, Poor	Shoe Rail: Good, Fair, Poor	Shoe Rail: Good, Fair, Poor	Pavement Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Rail Joints: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Points: Good, Fair, Poor	Dep. Lead Pulleys: Good, Fair, Poor	Dep. Lead Pulleys: Good, Fair, Poor	Dep. Lead Pulleys: Good, Fair, Poor	Safety Anchor: Good, Fair, Poor	Safety Latch Frame: Good, Fair, Poor	Safety Latch Tongue: Good, Fair, Poor	Turntable Latch: Good, Fair, Poor	Gypsy Mechanism: Good, Fair, Poor	Slot Width: (in fraction of in.)	Additional Remarks
1236	R	P	P	Y	R	CI	F	Brs	G	F	P	P	G	G																	5/8	
1244	R	P	P	N						G	P	P	G	G																	11/16	
1252	R	P	P	Y	R	CI	F	Brs	G	P	P	P	G	G																	5/8	Dragging
1260	R	P	P	Y	R	CI	F	Brs	G	P	P	P	G	G																	11/16	
1268	R	P	P	N						G	P	P	P	G																	9/16	
1274	R	P	P	Y	R	CI	P	Brs	G	P	P	P	P	G																	5/8	Stop
1280	R	P	P	Y	R	CI	P	Brs	G	P	P	P	P	G																	7/8	Stop
1288	R	P	P	N						F	P	P	P	G																	1	
1296	W	F	F	Y	DB	2/S	P/P	2/AF		P	P	P	P	P						G	P	P									1	
1298	R	P	P	N						F	P	P	P	P																	9/16	
1300	R	P	P	N						F	P	P	G	P																	9/16	
1302	Wood/Wood	F/F	F/F	Y	CR	CI	G	Bab	G	P	P	P	G	P																	3/4	30-in.
1308	Wood/Wood	F/F	F/F	Y	CR	CI	G	Bab	G	P	P	P	G	G																	1/2	30-in.
1314	R	P	P	Y	Urethane Alum.		P	AF	P	P	P	P	G	G																	5/8	
1320	R	P	P	N						G	P	P	G	G																	3/4	
1326	R	P	P	Y	PA	S	F	Brs	P	P	P	P	G	G																	1/2	
1332	R	P	P	N						G	P	P	G	G																	1/2	
1338	R	P	P	N						F	P	P	G	G																	1/2	
1340	W	F	F	N						P	P	P	G	P																	7/8	Pre-empt
1344	R	P	P	Y	PA	S	F	Brs	G	P	P	P	G	G																	7/8	
1350	R	P	P	Y	PA	S	G	Brs	G	G	P	P	P	G																	11/16	

Street: California From: Taylor To: Jones Inbound: Outbound X

Date 8 / 28 / 78

Hatch No. CA	Hatch Cover: Wood, Fiber, CI, Void	Hatch Cover: Good, Fair, Poor	Hatch Trace: Good, Fair, Poor	Pulley Present: Yes, No	Pulley Type: Cable, Chain	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good, Fair, Poor	Pulley Bearings: Anti-Fr., Sl. Brass, Babb.	Pulley Support: Good, Fair, Poor	Channel Condition: Good, Fair, Poor	Guide Rail: Good, Fair, Poor	Insert Rail: Good, Fair, Poor	Slot Rail: Good, Fair, Poor	Pavement Condition: Good, Fair, Poor	Switch Rails: Good, Fair, Poor	Switch Tongue: Good, Fair, Poor	Wye Rails: Good, Fair, Poor	Frog Rails: Good, Fair, Poor	Slot Guides: Good, Fair, Poor	Slot Points: Good, Fair, Poor	Dep. Trace: Good, Fair, Poor	Dep. Bear Pulleys: Good, Fair, Poor	Dep. Lead Pulleys: Good, Fair, Poor	Safety Anchor: Good, Fair, Poor	Safety Latch Trace: Good, Fair, Poor	Turnable Tongue: Good, Fair, Poor	Gypsy Wrecksticks: Good, Fair, Poor	Slot Width: (to fraction of in.)	Additional Remarks
1114	W	P	P	N						G	P	P		P															7/8	Take out
1120	R	P	P	N						G	P	P	G	P															5/8	
1126	W	P	P	Y	PA	S	G	AF	G	F	P	P	G	P															11/16	
1134	W	P	P	Y	PA	S	G	Bab	G	G	P	P	G	G															13/16	
1142	W	P	P	N						G	P	P	G	P															5/8	
1150	R	P	P	Y	R	CI	G	Brs	G	F	P	P	G	P															3/4	
1156	R	P	P	N						G	P	P	G	P															3/4	
1102	W	P	P	Y	R	CI	G	Brs	G	F	P	P	G	P															3/4	
1168	R	P	P	N						G	P	P	G	P															13/16	
1176	R	P	P	Y	R	CI	F	Brs	G	P	P	P	G	P															5/8	Dragging
1182	R	P	P	N						G	P	P	G	P															9/16	
1188	W	P	P	Y	R	CI	F	Brs	F	P	P	P	G	P															11/16	Stopped
1192	Wood/ Wood	F/F	F/F	Y	CR	CI	G	Bab	G	F	P	P	G	F															5/8	30-in.
1196	Wood/ Wood	F/F	F/F	Y	CR	CI	G	Bab	G	G	P	P	G	F															3/4	30-in.
1198	R	P	P	N						G	P	P	G	P															3/4	
1200	Wood/ Wood	F/F	F/F	Y	CR	CI	G	Bab	G	G	P	P	G	F															11/16	30-in.
1202	Wood/ Wood	F/F	F/F	Y	CR	CI	G	Bab	G	G	P	P	G	F															1/2	30-in.
1208	R	P	P	N						G	P	P	G	G															3/4	
1216	R	P	P	Y	Urethane Alum.		G	AF	G	G	P	P	G	F															11/16	
1220	R	P	P	Y	PA	S	F	Brs	G	F	P	P	G	G															11/16	
	R	P	P	Y	PA	S	F	Brs	G	F	P	P	G	G															3/4	Dragging

Street: California From: Mason To: Taylor Inbound: ____ Outbound X

Date 8/28/78

Hatch No.	Cover: Material	Cover: Condition	Cover: Type	Safety Pan Present:	Pulley Type: Yes No	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr., Brass, Babb.	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Outside Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot, Rail: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Mate Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Beam Frame: Good Fair Poor	Dep. Beam Pulleys: Good Fair Poor	Dep. Beam Anchor Good Fair Poor	Safety Latch Frame: Good Fair Poor	Safety Latch Tongue: Good Fair Poor	Turntable Latch: Good Fair Poor	Gypsy Mechanism Good Fair Poor	Slot Width: Good Fair Poor (in fraction of in.)	Additional Remarks
94	W	G	G	Y	CR	CI	G	AF	G	F	G	G	G	G													5/8	Hold down 20-in.
30	W	G	G	N						F	G	G	G	G													7/8	Signal return
32	W W	G/G	G/G	Y	CR	CI	G	Brs	G	P	G	G	G	G													15/16	20-in.
38	R	P	P	Y	Urethane Alum.		G	AF	G	F	P	P	G	P													5/8	
10e	R	P	P	Y	Urethane Alum.		F	AF	P	F	P	P	G	F													3/4	Pulley out of frame.
20	W	P	P	N						G	P	P	G	F													3/4	
26	W	P	P	N						G	P	P	G	P													3/4	Rope at bottom of channel.
32	CI	P	P	N						G	P	P	G	G													3/4	
42	CI	P	P	Y	Urethane Alum.		P	AF	G	F	P	P	G	F													3/4	
4e	W	P	P	Y	R	CI	P	Brs	G	P	P	P	G	P													5/8	Pulley stopped
52	W	P	P	N						G	P	P	G	P													5/8	
60	R	P	P	N						P	P	P	G	P													11/16	
68	R	P	P	Y	R	CI	G	Brs	G	P	P	P	G	P													3/4	
76	R	P	P	Y	R	CI	F	Brs	G	P	P	P	G	F													11/16	Pulley dragging
80	R	P	P	Y	Urethane Alum.		G	AF	G	P	P	P	G	F													11/16	Rope alongside
86	R	P	P	Y	R	CI	F	Brs	G	F	P	P	G	G													9/16	Pulley dragging
94	CI	P	P	Y	Urethane Alum.		F	AF	G	G	P	P	G	F													11/16	
98	R	P	P	N						P	P	P	G	P													5/8	
1100	W	F	F	N						P	P	P	G	F													7/8	
1106	R	P	P	N						P	P	P	G	P													3/4	
1112	W	P	P	Y	Urethane Alum.		G	AF	G	F	P	P	G	P													3/4	

California From: Powell To: Mason Inbound: Outbound X

Date 8 / 16/ 78

Hatch No. CA	Hatch Cover: Weld Frame, CI Hood	Hatch Cover: Good	Hatch Frame: Good	Pulley Frame: Fair	Pulley Present: Yes	Pulley Type: Open	Pulley Material: Iron	Pulley Condition: Good	Pulley Bearings: Fair	Pulley Support: Good	Channel Condition: Fair	Outside Rail: Good	Inside Rail: Good	Slot Rail: Good	Pavement: Good	Switch Rails: Good	Switch Tongue: Good	Vale Rails: Fair	Frog Rails: Good	Slot Guides: Good	Slot Point: Good	Dep. Brace: Good	Dep. Brace: Fair	Dep. Brace: Fair	Dep. Pulleys: Good	Safety Anchor: Good	Safety Latch: Good	Safety Latch: Good	Gypsy Mechanism: Good	Slot Width: (In fraction of in.)	Additional Remarks
900	R	P	P	N						G	P	P	G	F															7/8	
902	W	G	G	N						G	P	P	G	G															13/16	
904	Weld/ W	G/G	G/G	Y	DB	2/S	F/P	2/ Al		G	P	P		P								G	F	G					13/16	Signal return
906	W	G	G	N						G	P	P	G	F															3/4	
908	R	P	P	N						G	P	P	G	F															11/16	
'0	W	G	G	N						G	P	P	G	P															3/4	Signal return
4	R	P	P	N						G	P	P	P	P															9/16	
916	W	F	F	N						G	P	P		P															5/8	Take out
922	CI	P	P	N						G	P	P	G	P															5/8	
928	R	P	P	Y	Urethane Alum.		G	AF	P	G	P	P	G	P															1/2	
934	W	P	P	N						G	P	P	G	P															5/8	
940	R	P	P	N						G	P	P	G	P															5/8	
950	W	F	F	Y	PA	S	R	Bra	G	F	G	G	G	P															11/16	
960	CI	P	P	N						G	P	P	G	P															9/16	
966	R	P	P	Y	R	CI	P	Bra	G	P	P	P	G	P															5/8	Pulley down
972	R	P	P	N						G	P	P	G	P															5/8	
978	W	G	G	N						G	P	P	G	P															5/8	
982	R	P	P	Y	R	CI	P	Bra	G	G	P	P	G	F															11/16	Pulley down
984	W	G	G	N						G	P	P	G	P											G	G			7/8	Safety latch
986	W/W	G/G	G/G	Y	CR	CI	P	Bab	G	F	G	G	G	G															7/8	20"
988	W/W	G/G	G/G	N						F	G	G	G	G															3/4	Bumper bar

Street: California From: Stockton To: Powell Inbound: Outbound

Date 8 / 16/ 70

Hatch No. CA	Hatch Cover: Wood/Steel	Hatch Cover: Condition	Gasket: Fair/Poor	Gasket Present: Yes/No	Pulley Type: Cast Iron/Steel	Pulley Material: Cast Iron/Steel/Bronze	Pulley Guard: Condition	Pulley Bearing: Anti-Friction/Bronze	Pulley Support: Good/Fair/Poor	Channel: Condition	Gasket: Fair/Poor	Outside Rail: Condition	Inside Rail: Fair/Poor	Slot Rail: Fair/Poor	Pavement: Condition	Switch Rails: Fair/Poor	Switch Tongue: Fair/Poor	Rail Rails: Fair/Poor	Frog Rails: Fair/Poor	Slot Guides: Fair/Poor	Slot Points: Fair/Poor	Dep. Bar: Free/Fair/Poor	Dep. Bar Pulleys: Fair/Poor	Dep. Bar Anchor: Fair/Poor	Safety Latch: Fair/Poor	Safety Latch Free: Fair/Poor	Turnbuckle: Fair/Poor	Slot Gasket: Fair/Poor	Slot Width (in fraction of in.)	Additional Remarks
802	W/W	G/G	G/G	Y	DB	2/S		2/AF		F	P	P		F							G	P	G					1	
804	W	G	G	Y						G	P	P	G	F														3/4	Signal return
806	W/W	G	G	Y	DB	2/S	G/G	2/AF		P	P	P		P							G	G	P					1	
808	R	P	P	N						G	P	P	G	F														17/16	
814	R	P	P	N						G	P	P	G	F														5/8	
820	R	P	P	N						G	P	P	G	F														11/16	
826	R	P	P	P	N					G	P	P	G	F														5/8	
830	W	P	P	N					G	G	P	P	G	F														11/16	Pre-empt
832	R	P	P	Y	PA	S	P	Bra	G	P	P	P	G	F														5/8	Pulley stopped
840	R	P	P	N						G	P	P	G	F														9/16	
846	R	R	P	Y	Urethane Alum		G	AF	G	G	P	P	G	F														5/8	
850	R	P	P	N						P	P	P	G	P														3/4	
856	R	P	P	N						G	P	P	G	F														3/4	
860	W	G	G	N						G	P	P	G	F														5/8	Signal switch
862	R	P	P	N						G	P	P	G	P														11/16	
866	R	P	P	Y	Urethane Alum.		G	AF	G	G	P	P	G	P														3/4	
872	W	P	P	Y	PA	S	F	AF	G	F	P	P	G	F														9/16	
880	R	P	P	Y	R	CI	F	Bra	G	G	P	P	G	G														1/2	
886	Wood	F/F	F/F	Y	CR	CI	F	Bab	G	G	P	P	G	G														5/8	36"
890	Wood	F/F	F/F	Y	CR	CI	G	Bab	G	G	P	P	G	G														11/16	42"
898	R	P	P	N						G	P	P	G	P														3/4	

Street: California From: Grant To: Stockton Inbound: Outbound X

Date 8/16/78

Match No. CA	Match Cover: Weld Pipe, CI Rib	Match Cover: Cond. Good Fair Poor	Match Frame: Cond. Good Fair Poor	Pulley Present: Yes No	Pulley Type: Rod Groove	Pulley Material: Cast Iron, Steel, Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Ball Fr. Bronze Bshg.	Pulley Support: Brace Bshg.	Channel Condition: Good Fair Poor	Gutter Rail: Good Fair Poor	Inside Rail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Vale Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Bear Frame: Good Fair Poor	Dep. Bear Pulleys: Good Fair Poor	Safety Anchor: Good Fair Poor	Safety Latch: Good Fair Poor	Safety Latch Frame: Good Fair Poor	Turnbuckle Latch: Good Fair Poor	Gypsy Mechanism: Good Fair Poor	Slot Width: Good Fair Poor (in fraction of in.)	Additional Remarks
694	wood	G	P	Y	CR	CI	F	Bab	G	F	P	P	P	P														7/8	12"
700	W	G	G	N						F	P	P		P														1 1/4	Take out
702	W/W	G/G	G/G	Y	DB	2/S	G/G	2/AF		G	P	P		P							G	G	G					1 37/16	
704	W	F	F	N						F	P	P	P	P														1/2	Signal return
706	R	P	P	N						F	P	P	G	P														5/8	
712	R	P	P	N						G	P	P	G	P														9/16	
718	R	P	P	Y	Urethane Alum		G	AF	G	F	P	P	G	G														11/16	
724	R	P	P	N						G	P	P	G	P														11/16	
730	CI	P	P	Y	Urethane Alum		G	AF	G	F	P	P	G	F														1/4	
736	R	P	P	N						G	P	P	G	P														11/16	
742	R	P	P	Y	PA	S	P	Bra	G	G	P	P	G	G														5/8	
748	R	P	P	N						G	G	P	G	F														9/16	
756	R	P	P	N						G	P	P	G	P														5/8	
776	R	P	P	N						G	P	P	G	P														9/16	
780	W	P	P	Y	Urethane Alum		P	AF	G	F	P	P	G	P														11/16	Worn urethane
784	R	P	P	N						G	P	P	G	F														11/16	
788	R	P	P	Y	Urethane Alum.		G	AF	G	G	P	P	G	F														1/4	
790	W	G	G	N						G	G	G	G	P														1/4	Safety latch
794	W/W	G/G	G/G	Y	CR	CI	G	Bab	G	F	G	G	G	G														5/8	20"
798	W/W	G/G	G/G	Y	CR	CI	F	Bab	G	F	G	G	G	G														5/8	30"
800	W	G	G	N						F	P	P	G	F														1	Signal switch

Street: California From: Kearney To: Grant Inbound: Outbound X

Date 8 / 16 / 74

Hatch No. CA	Hatch Cover: Wood-Steel-Concrete	Hatch Cover: Good-Fair-Poor	Hatch Frame: Good-Fair-Poor	Pulley Frame: Yes-No	Pulley Pretent: Yes-No	Pulley Vanes: Pole-Square-Flat	Pulley Vanes: Cast Iron-Steel-Alum	Pulley Condition: Good-Fair-Poor	Pulley Bearings: Ball-Sleeve-Babbit	Pulley Condition: Good-Fair-Poor	Channel Condition: Good-Fair-Poor	Outside Rail: Good-Fair-Poor	Inside Rail: Good-Fair-Poor	Bad Rail: Good-Fair-Poor	Pavement Condition: Good-Fair-Poor	Switch Rails: Good-Fair-Poor	Switch Tongue: Good-Fair-Poor	Gate Rails: Good-Fair-Poor	Frog Rails: Good-Fair-Poor	Slot Guides: Good-Fair-Poor	Slot Points: Good-Fair-Poor	Dep. Bead Frame: Good-Fair-Poor	Dep. Bead Pulleys: Good-Fair-Poor	Dep. Bead Rollers: Good-Fair-Poor	Safety Hatch: Good-Fair-Poor	Safety Latch Free: Good-Fair-Poor	Safety Latch Torque: Good-Fair-Poor	Guard Mechanism: Good-Fair-Poor	Slot Width (in fraction of in.)	Additional Remarks
584	R	P	P	Y	PA	S	G	Hub	G	F	P	P	G	G															15/16	Rope high
590	R	P	P	Y	Urethane Alum		P	AF	G	F	P	P	G	G															15/16	Urethane gone
592	R	P	P	N						G	P	F	F	G															7/8	
598	R	P	P	N						G	P	P		P															15/16	
600	W/W	G/G	G/G	Y	DB	2/S	G/G	2/Al		G	P	P	P	F								G	G	G					1"	
606	R	P	P	N						G	P	P	P	P															13/16	
610	W	F	F	N						G	P	P		P															7/8	Take out
612	R	P	P	N						G	P	P	G	F															7/8	
618	R	P	P	N						G	P	P	G	F															7/8	
624	W	F	P	Y	Urethane Alum		F	AF	P	G	P	P	F	G															7/8	
628	R	P	P	N						G	P	P	P	P															1/16	
630	W	G	G	N						G	P	P	G	P															7/8	Pre-empt
636	R	P	P	Y	PA	S	F	Bra	G	G	P	P	G	P															3/4	
644	R	P	P	N						G	P	P	G	G															5/8	
650	W	P	P	Y	R	CI	G	Bra	G	G	P	P	G	G															11/16	Pulley stopped
660	R	P	P	Y	PA	S	F	Bra	G	P	P	P	P	G															13/16	
666	R	P	P	Y	R	CI	P	Bra	G	P	P	P	G	P															3/4	
670	W	F	P	N						G	P	P	G	P															13/16	Old mechanical switch
672	R	P	P	N						G	P	P	G	G															3/4	
670	R	P	P	N						G	P	P	G	P															3/4	
608	Wood/Wood	F/F	G/G	Y	CH	CI	F	Bab	G	F	P	P	G	P															5/8	36"

Street: _____ California _____ From: Montgomery To: Kearney Inbound: _____ Outbound X

Date 8/16/70

Hatch No. CA	Hatch Cover: Type	Hatch Cover: Condition	Paint: Color	Paint: Condition	Pulley: Type	Pulley: Condition	Pulley: Material	Pulley: Condition	Pulley: Bearings	Pulley: Bearing Condition	Pulley: Bearing Support	Pulley: Support Condition	Sheave: Type	Sheave: Condition	Sheave: Material	Sheave: Condition	Sheave: Bearings	Sheave: Bearing Condition	Sheave: Bearing Support	Sheave: Support Condition	Switch: Type	Switch: Condition	Switch: Tongue	Switch: Condition	Rail: Type	Rail: Condition	Slot Guides: Type	Slot Guides: Condition	Slot Points: Type	Slot Points: Condition	Deep Beam: Type	Deep Beam: Condition	Rep. Type	Rep. Condition	Leg: Type	Leg: Condition	Safety Latch: Type	Safety Latch: Condition	Turnbuckle: Type	Turnbuckle: Condition	Cable: Type	Cable: Condition	Cable Diameter (in fraction of inch)	Additional Remarks
470	R	P	P	Y	PA	S	F	Bab	P	G	P	P	G	G																												13/16	
474	R	P	P	Y	PA	S	F	Bab	F	F	P	P	P	F																												7/8	
478	W	P	P	Y	PA	S	P	Bab	P	F	P	P	G	G																												7/8	Rope high
482	R	P	P	N						F	P	P	G	G																												7/8	
486	W	G	G	N						F	P	P		G																												13/16	Take out
488	R	P	P	Y	PA	S	F	Bab	P	P	P	P	P	G																												7/8	Pulley stopped
426	R	P	P	Y	Urethane Alum.	G	GF	G	F	P	P	G	P																												7/8	
500	R	P	P	N						P	P	P	P	P																												7/8	Sewer drain
506	R	P	P	N						G	P	P	P	G																												7/8	
512	R	P	P	N						G	P	P	G	F																												15/16	
518	R	P	P	N						G	P	P	G	F																												7/8	
524	R	P	P	N						G	P	P	G	F																												15/16	
530	R	P	P	Y	PA	S	F	Bab	G	G	P	P	G	F																												7/8	Rope high
536	R	P	P	N						G	P	P	G	F																												15/16	
540	R	P	P	Y	PA	S	F	Bab	G	G	P	P	P	F																												7/8	
548	R	P	P	Y	PA	S	F	Bab	F	P	P	P	G	F																												15/16	Rope high
554	R	P	P	N						G	P	P	G	F																												7/8	
560	R	P	P	Y	PA	S	G	Bab	G	F	P	P	G	F																												1 1/8	
566	R	P	P	Y	PA	S	F	Bab	P	P	P	P	G	F																												1	Pulley dragging
572	R	P	P	Y	PA	S	F	Bab	G	G	P	P	G	F																												7/8	
578	R	P	P	Y	PA	S	F	Bab	P	F	P	P	G	G																												1 1/16	

83

Street: California From: Battery To: Montgomery Inbound: _____ Outbound X

Date 8/16/78

Watch No. CA	Watch Cover: Brick Pavers, CI Grid	Watch Cover: Good Fair Poor	Watch Frame: Good Fair Poor	Pulley Present: Yes No	Pulley Type: Pole Pulleys Pulley Pulleys	Pulley Material: Cast Iron Steel, Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Fr. Brass Babb.	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Gooseneck Condition: Good Fair Poor	Trestle Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition Good Fair Poor	Switch Rails: Good Fair Poor	Switch Tongue: Good Fair Poor	Gate Rails: Good Fair Poor	Frog Rails: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Brace: Good Fair Poor	Dep. Brace Fence: Good Fair Poor	Dep. Brace Pulleys: Good Fair Poor	Safety Anchor Good Fair Poor	Safety Latch Good Fair Poor	Safety Latch Fence: Good Fair Poor	Turnable Latch Tongue: Good Fair Poor	Gypsy: Good Fair Poor	Slot: Width: Good Fair Poor (in fraction of in.)	Additional Remarks
314	R	P	P	N						G	P	P	G	F															7/8	
318	R	P	P	Y	PA	S	F	Bab	F	G	P	P	G	F															11/16	
324	R	P	P	N						G	P	P	G	G															11/16	
322	R	P	P	Y	PA	S	F	Bab	F	G	P	P	G	F															7/8	Pulley dragging
340	R	P	P	N						G	P	P	G	F															7/8	
348	R	P	P	N						G	P	P	G	F															7/8	
354	R	P	P	Y	PA	S	F	Bab	G	G	P	P	F	F															1	Pulley dragging
360	R	P	P	Y	PA	S	F	Bab	P	F	P	P	G	F															1	Pulley dragging
366	R	P	P	Y	PA	S	P	Bra	G	F	P	P	G	F															7/8	Pulley stopped
376	W	P	P	Y	PA	S	G	Bab	F	P	P	P	F	G															7/8	
380	R	P	P	N						G	P	P	P	P															7/8	
400	R	P	P	Y	PA	S	F	Bab	G	G	G	G	P	P															3/4	
408	W	P	P	N						G	P	P	G	P															7/8	
416	W	F	P	Y	PA	S	F	Bab	G	G	P	P	G	P															1	
424	R	P	P	N						G	P	P	G	P															7/8	
432	R	P	P	N	PA	S	F	Bab	G	F	P	P	G	P															15/16	
440	R	P	P	N						G	P	P	G	P															3/4	
448	R	P	P	Y	Urethan Alum		G	AF	G	E	P	P	G	P															3/4	
456	R	P	P	N						G	P	P	G	F															13/16	
460	R	P	P	Y	PA	S	G	Bab	F	F	P	P	G	G															3/4	
466	R	P	P	N						G	P	P	G	F															7/8	

Street: California From: Davis To: Battery Inbound: Outbound 4

Date 8/16/78

Hatch No. CA	Hatch Cover: Weld	Hatch Cover: Paint	Hatch Cover: Cl Yard	Hatch Frame: Paint	Hatch Frame: Cl Yard	Pulley Present:	Pulley Type:	Pulley Keyway:	Pulley Material:	Cast Iron Steel Alum	Pulley Condition:	Pulley Bearings:	Anti-Fr. Brng:	Pulley Support:	Channel Condition:	Guide Pan:	Guide Pan:	Slot Fair:	Slot Fair:	Pavement Condition	Switch Rails:	Switch Tongue:	Gate Rails:	Gate Rails:	Frog Rails:	Frog Rails:	Slot Guides:	Slot Guides:	Slot Point:	Slot Point:	Dep. Base Plate:	Dep. Base Plate:	Dep. Base Pulley:	Dep. Base Pulley:	Safety Anchor	Safety Anchor	Safety Latch Frame:	Safety Latch Frame:	Turnbuckle Latch:	Turnbuckle Latch:	Gypsy Mechanism	Gypsy Mechanism	Slot Width (in fraction of in.)	Additional Remarks
152	R	P	P	Y	PA	S	F	Bab	P	F	P	P	G	P																													1	Pulley stopped
162	R	P	P	N						G	P	P	G	P																													7/8	
172	R	P	P	Y	PA	S	G	Bab	G	F	P	P	G	G																													15/16	
178	R	P	P	N						G	P	P	F	G																													13/16	
186	R	P	P	Y	PA	S	G	Bab	F	F	P	P	F	G																													7/8	
192	R	P	P	N						G	P	P	G	G																													7/8	
198	R	P	P	Y	PA	S	P	Bab	P	G	P	P	P	P																													11/16	
202	R	P	P	Y	PA	S	F	Bab	F	G	P	P	F	P																													7/8	
206	R	P	P	N						G	P	P	F	G																													7/8	
210	R	P	P	Y	Urethane Alum		G	AF	G	F	P	P	G	P																													7/8	Rope & Singside pulley
218	R	P	P	N						G	P	P	G	G																													7/8	
226	R	P	P	Y	PA	S	F	Bab	P	F	P	P	G	F																													15/16	Pulley turning slow
234	R	P	P	N						G	P	P	G	G																													7/8	
242	R	P	P	Y	PA	S	G	Bab	P	P	P	P	G	G																													15/16	
250	R	P	P	Y	PA	S	P	Bra	G	G	P	P	G	F																													13/16	Flat spot on pulley
256	R	P	P	Y	PA	S	F	Bab	P	G	P	P	G	G																													7/8	
260	R	P	P	Y	PA	S	P	Bra	G	G	P	P	G	G																													7/8	Pulley stopped
270	R	P	P	Y	PA	S	G	Bab	G	G	P	P	G	G																													7/8	
290	R	P	P	Y	PA	S	P	Bra	P	P	P	P	G	G																													13/16	Pulley down
300	R	P	P	Y	PA	S	F	Bab	G	G	P	P	P	P																													11/16	
310	R	P	P	Y	PA	S	P	Bab	F	P	P	P	F	P																													7/8	Pulley stopped

Street: California From: Drumm To: Davis Inbound: Outbound X

Date 8/16/78

Batch No. CA	Hatch Cover: Good Fair Poor	Hatch Cover: Good Fair Poor	Hatch Cover: Good Fair Poor	Pulley Trace: Good Fair Poor	Pulley Flange: Good Fair Poor	Pulley Flange: Good Fair Poor	Pulley Material: Cast Iron Steel Alum.	Pulley Condition: Good Fair Poor	Pulley Bearings: Anti-Friction Sleeve	Pulley Support: Good Fair Poor	Channel Condition: Good Fair Poor	Cutaway Fails: Good Fair Poor	Notice Fail: Good Fair Poor	Slot Rail: Good Fair Poor	Pavement Condition: Good Fair Poor	Switch Points: Good Fair Poor	Switch Tongue: Good Fair Poor	Rate Meter: Good Fair Poor	Trap Door: Good Fair Poor	Slot Guides: Good Fair Poor	Slot Point: Good Fair Poor	Dep. Curve: Good Fair Poor	Dep. Bed Trace: Good Fair Poor	Dep. Pulleys: Good Fair Poor	Dep. Cross Anchor: Good Fair Poor	Safety Latch: Good Fair Poor	Safety Latch Trace: Good Fair Poor	Safety Latch Tongue: Good Fair Poor	Guy Wire: Good Fair Poor	Guy Wire Insulator: Good Fair Poor	Guy Wire Insulator: Yes No	Additional Remarks
04	W	G	G	R						P	P	P	G	G	P	P	P	F	G	G											7/8	
05	R	F	F	Y	PA	S	P	Bab	G	F	G	G	G	G																	1/8	
07	R	P	P	N						G	P	P	G	F																	3/4	
012	R	P	P	Y	PA	S	F	Bab	P	F	P	P	G	F																	1"	
2	R	P	P	Y	PA	S	G	Bab	G	P	P	P	G	F																	1/8	
10	R	P	P	Y	PA	S	G	Bab	P	F	P	P	G	G																	1	
16	R	P	P	Y	PA	S	F	Bab	G	G	P	P	G	F																	1 1/8	
18	R	P	P	N						F	P	P	G	P																	1 1/4	